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ABSTRACT

This guide to environmental health planning outlines the process and procedures of bringing together certain fundamental data pertaining to various physical aspects of the environment, including data collection, evaluation, usage, and implementation. The components of such planning programs are listed along with study preparation information. Emphasis is given to the evaluation of health related utilities and services that readily lend themselves to long-range planning, such as water, sewage, and solid wastes. Programs for dealing with air pollution and housing are mentioned in this connection. Data forms, study maps and the locations of U.S. Department of Health, Education and Welfare regional offices are included. (TG)

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ENVIRONMENTAL HEALTH PLANNING GUIDE

U.S. DEPARTMENT OF HEALTH, EDUCATION
& WELFARE
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Health Agency Operations
Physical Development Planning Agency Operations
Air Pollution Control
Food Protection
Public Sewerage
Public Water
Radiological Health
Recreational Sanitation
Residential Environment: Housing and Neighborhoods
Sanitation Services
Solid Wastes Collection and Disposal
Vector Control
Environmental Health Project Programming

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PREFACE

Health in communities depends to a large extent on the degree to which healthful qualities are present in the urban environment of air, food, water, land and structures on the land.

Just as an adequate community plan for physical development must include a number of environmental health elements, so also must plans for improving environmental health deal with the physical components of cities as well as health inspections and enforcement of regulations.

This Guide is designed to assist in the preparation of the environmental health plan as a part of the comprehensive health plan (physical, mental and environmental) prepared by each State and urban area. Its use will identify to the community and the State those factors which contribute to a healthful environment, the steps needed to achieve and maintain a positively healthful environment, now and in the future, and the resources and timing required to carry out the necessary steps.

As originally published, the Guide was based upon experiences gained in working with diverse groups in ten different urban areas, large and small. The varied sponsors included health departments, planning departments, chambers of commerce, city and county governments, and a mixed committee of industrial, commercial, and citizen representatives.

The first revised edition incorporated experience gained through working with an additional twenty-five urban areas, including metropolitan areas. The revision reflected knowledge gained in various categorical fields and included a strengthened chapter on implementation.

The second revision represented an attempt to make the document more responsive to 1966 Federal Partnership for Health Legislation, Public Law 89–749 and Model Neighborhoods in Demonstration Cities under the Demonstration Cities and Metropolitan Development Act of 1966, Public Law 89–754.

This revision is being reprinted in a limited quantity as we recognize that this publication has limited application, as an introductory or training document for lay and general health oriented groups. We propose to supplement this document with a series of publications including a definitive, technical manual for the professional environmental health administrator and urban planner; a publication for the community "decision maker" explaining the implications of the environmental health plans and decisions from his point of view, and a training manual with survey forms which will be used in the field by participants in an actual survey.

Robert E. Novick
Director, Bureau of Community
Environmental Management

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INTRODUCTION

What is environmental health planning? Webster gives the following definitions for these three words:

environment—the aggregate of all the external conditions and influences affecting the life and development of an organism, human behavior, society, etc.

health—state of being hale or sound in body, mind, or soul; especially, freedom from physical disease or pain. The World Health Organization defines health as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

planning—devising or projecting a method or course of action, procedure, or arrangement.

Thus the term "environmental health planning" means the process of surveying and analyzing both present and anticipated future external conditions and influences affecting the physical, mental and social well-being of the individual or community, and then developing a method or course of action for environmental control to promote such well-being.

All public health professionals who are engaged in some aspect of environmental health are interested in and concerned with the human environment *per se*. Within the context of health, the environment is viewed as the ecological habitat of man, and since the physical and mental health of man bears a multi-faceted relationship to his habitat, the quality of the human environment is clearly a health concern.

The nature and character of the environment of man as traditionally conceived is evolving at an increasingly rapid rate and in a direction not fully understood. This Nation is experiencing an urbanizing phenomenon unique in the history of mankind, and it is characterized by the progressive displacement of an environment conditioned primarily by nature by a man-contrived environment that is highly complex in physical and social organization. By the turn of the century, the physical development of this new environment will have resulted in a capital outlay of many trillions of dollars, and hence will constitute a long-range commitment, for better or for worse, spanning many generations.

This Guide deals primarily with the process of bringing together certain fundamental data pertaining to various physical aspects of the environment. The list of environmental aspects included here does not profess to be all-inclusive but encompasses those categories where obvious and direct hazard to health has been widely recognized. Emphasis has been given to the evaluation of health-related utilities and services that readily lend themselves to long-range planning such as water, sewerage, solid wastes, air pollution, and housing programs. Health department inspectional services are covered in an organizational sense, and reference is made to existing rating schedules for a number of these vital services.

The procedures described in this document can be applied to as small an area as a town or as large an area as an entire metropolitan region. They are particularly suited for use in multi-jurisdictional areas. This revision of the Guide reflects changes learned in the utilization of previous versions in over 25 urban communities.

Regardless of how perfect a plan is developed, it will serve no useful purpose unless it leads to action. It was with this realization that greater emphasis has been placed upon implementing the plan, and this section of the Guide has been strengthened in the hope that it will lend better guidance for the implementation phase.

CONSULTATION SERVICES: Within the limits of available consultant personnel, the Public Health Service will provide assistance in the organization of local studies where State and local counterpart personnel are made available.

Ordinarily, such services will consist of (a) orientation in Environmental Health Planning concepts, (b) explanation of data collection procedures, and (c) assistance in the analysis and design phases after the data collection is completed.

Requests for consultative service should be directed to U. S. Department of Health, Education, and Welfare Regional Offices (See inside rear cover), through the State Health Department.

Chapter I

PREPARING FOR THE STUDY

ORGANIZING AND FINANCING

The initiative for organizing a study of environmental health problems, programs, and resources may be taken by any individual, organization or governmental agency in a community.

Invitations to participate in planning and carrying out the study should be extended to:

1. All agencies with responsibilities related to producing a more healthful environment;
2. Interested groups (e.g., civic associations, business associations, service clubs);
3. Persons who have special skills needed in conducting the study or in implementing recommendations that may grow out of the study (e.g., skilled interviewers, writers, opinion leaders);
4. Respected representatives of population groups likely to be affected by the study (e.g., elected officials, interested citizens).

Environmental health is such a broad subject that a single organization usually does not have all of the necessary information or technical specialists.

Various combinations of individuals and groups work together to give effective leadership, depending on problems, resources, and interests. Since studies are not ends in themselves but are intended to stimulate action, participation by key representatives of the public is essential in addition to participation by technical personnel.

Reasons for providing opportunities for this participation by selected persons who have no special training in environmental health are as follows:

1. People have a right to be represented when decisions affecting them will be made;
2. People who are not health specialists often have useful talents not possessed by these specialists;
3. People who play an active role in obtaining facts and making recommendations about environmental health problems are likely to help solve the problems.

The structure of participation may develop in different ways. Some examples follow:

1. A few interested persons may explore ideas in a preliminary fashion, then invite others to join them in planning and carrying out the study;
2. A large group consisting of representatives of all interested organizations may be called together for a general discussion followed by establishment of working committees, and an advisory committee;
3. An already organized coordinating group (e.g., a community council) may take responsibility for conducting the study.

The types of committees, if any, that are set up would depend on the local situation. One arrangement would be to have a separate task force working on each of the sections listed in Chapter II of this guide with representatives of these task forces forming an executive or steering committee. Additional committees may be considered appropriate to provide such services as obtaining financial support, informing the public, providing liaison with certain groups, or conducting training courses for volunteers.

These committees are most likely to be effective if:

1. Chairmen are respected and have skills at leading group discussion;
2. Members have a real desire to study and act on environmental health problems;
3. Objectives and methods are specific and clearly understood by all;
4. Consultants are called in when needed.

Preliminary plans about how to put study recommendations into action should be made during the organizational phase. The reason for this is that certain steps taken during the study process (e.g., keeping the public informed) may increase the probability of subsequent action.

Advice on methods of helping citizen groups study environmental health problems in a way that is likely to lead to action may be obtained from specialists in public health education, community development, community organization, or adult education.

Besides manpower, other resources that may be needed include money and materials. Some of the materials that are useful are the following: a dozen basic maps, transparent overlays for the maps, and a final report. Federal financial assistance for some aspects of the studies may be available through the area-wide comprehensive health planning program of the U. S. Public Health Service. Area-wide comprehensive health planning grants have been authorized by the U. S. Congress in the Comprehensive Health Planning and Public Health Service Amendments of 1966. The health planning grants, which may pay up to three-quarters of the cost of comprehensive health planning work, are made for the purpose of developing a comprehensive health plan for health facilities, services, and manpower, in the entire range of environmental, mental and physical health. Further information about the health planning grants may be secured from the regional offices of the DHEW located in Boston, New York, Charlottesville, Atlanta, Chicago, Kansas City, Dallas, Denver and San Francisco. Other Federal financial assistance for certain aspects of the studies may be available through the Urban Planning Assistance Program of the Department of Housing and Urban Development. The urban planning grants, which generally pay up to two-thirds of the cost of the planning work (and up to three-quarters in certain cases), are made for the purpose of developing a comprehensive plan for the physical growth and development of an area. Further information about these grants may be secured from the regional offices of the Department of Housing and Urban Development located in New York, Philadelphia, Atlanta, Chicago, Ft. Worth, San Francisco and San Juan, Puerto Rico.

BASIC STUDY NEEDS

Before undertaking the completion of specific study questions, several maps and charts should be prepared which are applicable to all portions of the survey proceedings. These are:

AREA MAP

One standard map size should be adopted and at least a dozen copies should be obtained. While an existing map can be used, it has been found much easier to prepare a base map showing only the study area boundaries and the outlines and names of the major governmental units in the survey area. Miscellaneous information such as street and highway locations, township or section lines, etc., often confuse the data shown in this study and should be deleted, if possible.

Area maps should be of such a scale as to promote ease of showing data and presenting them at meetings. When the study has reached the report preparation stage, map size can be reduced as needed. A typical area map (reduced size) is shown on page 89.

POPULATION DENSITY MAPS AND POPULATION DATA

Two population density maps will be needed; one showing present densities and the other showing projected future densities. (See pages 91 and 92). These data should be superimposed on two of the area maps and should group densities into four categories as follows:

(Use for maps) **Population Density**	(For information only) **Equivalent Lot Size**
Over 5,000 persons per square mile	Less than ½ acre
2,500 to 5,000 persons per square mile	½ to 1 acre
1,000 to 2,500 persons per square mile	1 to 2 acres
Less than 1,000 persons per square mile	Over 2 acres

In computing population densities, geographic units should be small enough to indicate significant population concentration. Too large an area may obscure the local population densities, and units as small as one square mile are usually desirable. In communities having official planning agencies, the information needed for these maps is usually available or can be readily obtained by the planning group for map preparation.

Where there is no community planning agency and where population data are not available, other data sources should be explored. U.S. Bureau of the Census information can be used for past figures and local Chambers of Commerce often have data on current estimates.

Public utility companies, school board records, real estate groups and similar sources may have useful data for population estimates.

Population forecasting should extend at least 10 years into the future and preferably should also be made for a longer period. Professional guidance is essential for making population projections since this is a difficult task. A recommended discussion of the subject is given in *Population Projections for Local Areas* by M. Zitter in Public Works. June 1957.

DRAINAGE, SOIL AND FLOOD HAZARD MAPS

A determination is needed of the major drainage basins of the area under study, and it is helpful to have soil characteristics also shown on this map.

Topographic maps for use in preparing drainage maps can be obtained for almost all communities from the U.S. Geological Survey, Washington, D.C., if not already available locally. By tracing stream and ridge lines the major drainage basins can be identified.

Soil characteristics provide helpful information where these data are available. For ease of preparation it is usually sufficient to show only three broad classifications; usually permeable and well drained, not usually permeable or not well drained, and poor permeability and drainage. Local offices of the U.S. Department of Agriculture often can supply soil maps which are adaptable for study purposes. A typical reduced size drainage and soil map is shown on page 94.

A desirable adjunct to the general drainage map is a flood hazard map, which is useful in allowing better planning for development of areas subject to periodic flooding.

Flood hazard maps may be prepared by planning or public works agencies or by consultants in this field. Information and data are available through the Corps of Engineers, the Weather Bureau, or the U. S. Geological Survey. A typical reduced size flood hazard map is shown on page 92.

GOVERNMENTAL BACKGROUND

Information on the type, powers and functions of each governmental and quasi-governmental unit within the study area should be obtained.

If not readily available from local officials, this information can be found in the State Statutes. In preparing the information, charts similar to the one shown may be useful. It should be noted that all statutory powers are not necessarily used, as would be the case where a town chose to purchase water from a private water company or another city instead of operating a municipal plant.

In connection with the gathering of this information, a copy of any ordinances or regulations pertaining to the listed functions will be useful in later considerations and should be obtained for reference.

UNITED STATES POPULATION, 1950-1966, AND PROJECTED POPULATION, 1970-2000

Total Population Including Armed Forces Abroad (in millions)

(July 1)	
1950	150.3
1	154.9
2	157.6
3	160.2
4	163.0
5	165.9
6	168.9
7	172.0
8	174.9
9	177.8
1960	180.7
1	183.8
2	186.7
3	189.4
4	192.1
5	194.6
6	196.8

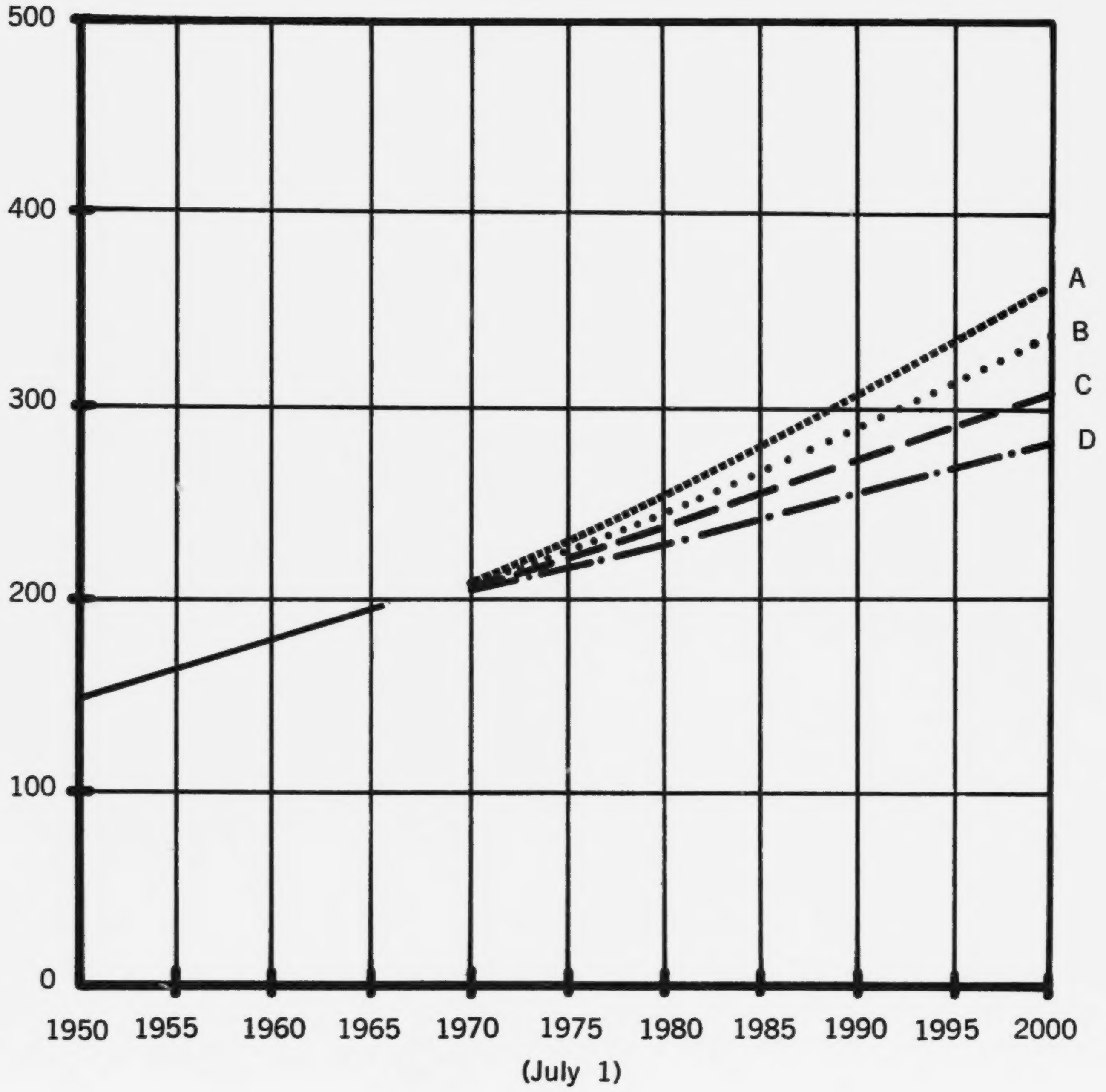
	Series A	*Series B*	*Series C*	*Series D*
1970	208.6	207.3	206.0	204.9
75	227.9	223.8	219.4	215.4
80	250.5	243.3	235.2	227.7
85	274.7	264.6	252.9	241.7
90	300.1	286.5	270.8	256.0
95	328.5	309.8	288.8	269.5
2000	361.4	336.0	307.8	282.6

Notes: (1) The four series differ only with respect to fertility assumptions. Series A approximately equals calendar year total fertility rate in 1963; Series B, 1964 and 1965; Series C, 1966; Series D, early 1940's.

(2) Series A and D are *not* regarded as probable upper and lower limits.

Source: U. S. Department of Commerce, Bureau of the Census, *Current Population Reports, Population Estimates, Series P-25, No. 359,* Feb. 20, 1967, and *No. 361*, Feb. 21, 1967.

UNITED STATES POPULATION PROJECTIONS
Total Population Including Armed Forces Abroad
(in millions)



Source: Preceding table

GOVERNMENTAL BACKGROUND SUMMARY

Name	Form	Activities									
		Health Department	Sewage Collection	Sewage Treatment	Water Supply	Refuse Collection & Disposal	Air Pollution Control	Housing Agency	Zoning	Subdivision Regulations	Planning Agency

If agency is not empowered to carry out the activity use "no". If agency is empowered to carry out the activity but does not, enter a dash. If agency carries out the activity, use "yes".

Chapter II

COLLECTING AND EVALUATING THE DATA

General basic data having been obtained, collection of detailed information on programs related to environmental health can be undertaken. The information needed to evaluate the various services and operations is outlined in a series of questionnaire forms under each subject. One set of forms should be filled out for each agency carrying out a particular function in the study area. For example, if there are four separate sewerage agencies, data are to be obtained for each one on a separate set of forms. Sample data reporting forms are shown for each program analyzed. Additional forms are available through the Regional Offices shown on the inside rear cover or they may be reproduced without permission. The program data forms are followed by suggested summary charts for ease in subsequent evaluation. Following the summary charts, evaluation guides are given under each subject heading. These guides are based on the experience of local, state and Public Health Service engineers and sanitarians aided by supporting health professionals in other fields such as city planning and sociology, and on published and unpublished research material. They are necessarily broad and should be considered as goals of good practice. After the data have been collected and summarized, the evaluation guides may be used in determining how well the local situations meet these criteria. Any deficiencies which appear should be noted as preliminary conclusions of the study and will be given further consideration later.

A. HEALTH AGENCY OPERATIONS

This section is designed to obtain general information on the staffing, financing, organization and environmental health planning activities of the health agency.

HEALTH AGENCY OPERATIONS — DATA FORM

1. **Health Department (Name)** ....

2. **Area covered** .... **Population served** ....

3. **Environmental Health Staff:**

	Number	*Monthly Salary Range*
Engineers	....	....
Sanitarians	....	....
Other health professionals	....	....

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4. Health department annual budget ....

Sources of Funds (City, County, State, Federal, etc.)	Amount Total	 Environmental
....	....	....
....	....	....
....	....	....
....	....	....

5. Has the State legislature adopted its own version of the U. S. Public Health Service *Urban Water Supply and Sewerage Systems Act and Regulations*, providing for advance planning of water and sewer systems by urban areas? Yes .... No .... Identify ....

6. Has a State comprehensive health planning agency been established or designated? Yes .... No ....

Identify ....

7. Has the State comprehensive health planning agency divided the State into areas for purposes of areawide comprehensive health planning? Yes .... No .... How many? .... Identify on State map.

8. Has an areawide comprehensive health planning agency (or organization) been established for the study area? Yes .... No .... Identify ....

9. Does the areawide comprehensive health planning agency conduct or oversee a program of environmental health planning for the study area? Yes .... No .... Identify working unit(s) ....

....

10. If no areawide *comprehensive health* (physical, mental and environmental) planning agency has been established to date, is there an areawide *environmental health* planning activity? ....

Identify ....

11. Is the *areawide* environmental health planning activity based on a *local* environmental health planning activity in each local jurisdiction within the area having a separate health department? ....

Identify each ....

12. Is the areawide environmental health planning activity fully coordinated with a metropolitan or regional physical development planning agency?
    a. Through contact between their respective planning directors? ....
    b. Through contact between respective planning agency chairmen? ....
    c. Through contact between respective planning agency members? ....
    d. By having the environmental health planning activity serve as an advisory group to the physical development planning agency and its staff? ....
    e. By submitting environmental health plans developed and adopted by the areawide environmental health planning agency to the physical development planning agency for review and adoption (in whole or in part) by it also? ....
    f. By having its planning area boundaries approved by the Governor, in accordance with Federal requirements for provision of assistance from the U. S.? ....

13. Does each environmental health planning activity (areawide and local) in the study area, have a study design, including specific time schedule, for preparation, adoption and periodic review of (a) the various functional elements of an environmental health plan, (b) a long-range, integrated, comprehensive environmental health plan, and (c) the implementing measures therefore, as detailed in the following table? ....

Identify each study design: ....

....

....

....

PLANNING PROGRAM FOR PREPARATION OF AN ENVIRONMENTAL HEALTH PLAN

Components of Environmental Health Planning Program	Start (Date)	Finish (Date)	Adoption by Health Plg. Agency* (Date)	Adoption by Physical Development Plg. Agency** (Date)	Start Periodic Review*** (Date)
A. Study Design					
B. Functional Plan Elements					
1. Water					
a. Water Supply Plan					
b. Water Resources Plan (Surface and ground waters)					
c. Flood Control Plan					
d. Storm Drainage Plan					
e. Sedimentation Control Plan					
2. Sewerage Plan					
3. Solid Wastes Disposal Plan					
4. Air Pollution Control Plan					
5. Residential Environment Plan (Housing and Neighborhoods)					
6. Occupational Health Plan					
7. Institutional Sanitation Plan					
8. Recreation Plan					
9. Injury Control Plan					
10. Radiological Health Plan					
11. Milk and Food Plan					
12. Vector Control and General Sanitation Plan					
13. Noise Control Plan					
C. Long-range, integrated, comprehensive Environmental Health Plan					
D. Implementing Measures					
1. Water					
a. Water Quality Standards (State and Local)					
(1) Drinking Water					
(a) PHS Drinking Water Standards					
(b) Sanitary Standards for Bottled Water					
(c) Ordinance for Water Well Construction					
(d) Cross-Connection Control Ordinance					
(2) Recreational Waters					
(a) Artificial (pools, etc.)					
(b) Natural (lakes, estuaries, coastal, etc.)					

Components of Environmental Health Planning Program	Start (Date)	Finish (Date)	Adoption by Health Plg. Agency* (Date)	Adoption by Physical Development Plg. Agency** (Date)	Start Periodic Review*** (Date)
(3) Water for Food Production					
(a) Aquatic (shellfish, other fish)					
(b) Agricultural					
(4) Industrial Water Supplies					
b. State Water Pollution Control Regulations					
c. Urban Water Supply and Sewerage Systems Act and Regulations (State)					
d. Rezoning Plan by Time Stages to Match Planned Availability of Public Facilities: Water, Sewer, Transportation, Schools, etc.					
e. Water Well Construction and Pump Installation Act (State)					
f. Individual Sewerage Disposal Systems Act and Regulations (State)					
g. Plumbing Code					
h. Zoning Ordinance;					
(1) Flood Plain Zoning;					
(2) Surface Water Quality Zoning					
i. Subdivision Regulations — Storm Drainage Provisions					
j. Sedimentation Control Ordinance (Urban erosion control)					
2. Sewerage					
a. Urban Water Supply & Sewerage Systems Act & Regulations (State)					
b. Individual Sewage Disposal Systems Act & Regulations (State)					
c. Plumbing Code					
3. Solid Wastes Disposal					
a. Solid Wastes Disposal Sections of State Sanitary Code					
b. Solid Wastes Disposal Sections of Local Sanitary Code					
c. State Enabling Legislation for Regional Solid Wastes Disposal Districts or Authorities					
d. Regional Solid Wastes Disposal District and Regulations					
4. Air Pollution					
a. Air Pollution Control Ordinance					
b. Zoning Ordinance					
(1) Performance Standards for Air Pollutant Emissions					
(2) Air Pollution Control Zones					

Components of Environmental Health Planning Program	Start (Date)	Finish (Date)	Adoption by Health Plg. Agency* (Date)	Adoption by Physical Development Plg. Agency** (Date)	Start Periodic Review*** (Date)
c. Building Code: Standards for Heating and Incineration Equipment					
5. Residential Environment					
a. Zoning Ordinance					
b. Subdivision Regulations					
c. Housing, Maintenance and Occupancy Code					
d. Neighborhood Standards Code					
e. Building Code					
f. Plumbing Code					
g. Electrical Code					
h. Fire Code					
i. Mobile Home Park Ordinance					
j. Public Open Space Easements over Private Property					
k. Private Deed Restrictions (covenants), especially for common areas managed by Homes Associations					
6. Occupational Health Regulations					
a. Threshold Limit Values by American Conference of Governmental Industrial Hygienists					
b. Uniform Industrial Hygiene Codes, Regulations and Supplements, also by ACGIH. (State or Metro.)					
c. State Codes and Regulations for Specific Industries, Operations and Substances. (Vary from State to State)					
d. Occupational Disease Reporting Regulations (State)					
e. Industrial Hazards Ordinance (Local)					
7. Licensing Provisions and Regulations for Institutions					
8. Recreation					
a. Campgrounds and Organized Camps Ordinance and/or Regulations					
b. Recreational Vehicle[1] Parking Area Ordinance and/or Regulations					
c. Swimming Pools and Outdoor Bathing Areas Ordinance and/or Regulations					

Components of Environmental Health Planning Program	Start (Date)	Finish (Date)	Adoption by Health Plg. Agency* (Date)	Adoption by Physical Development Plg. Agency** (Date)	Start Periodic Review*** (Date)
9. Injury Control Program Regulations					
10. Radiological Health Control Regulations					
11. Milk and Food a. Grade "A" Pasteurized Milk Ordinance and Administrative Procedures					
b. Requirements and Administrative Practices in Evaluation and Approval of Milk Laboratories					
c. Administrative Procedures for Making Sanitation Ratings of Milksheds					
d. Food Service Sanitation Ordinance and Code					
e. Vending of Food and Beverages Sanitation Ordinance and Code					
f. Procedure for Evaluating Food Service Sanitation Programs					
g. Sanitary Standard for Manufactured Ice					
h. National Shellfish Sanitation Program Manual of Operations Part I *Sanitation of Shellfish Growing Areas,* 1965 revision. PHS Pub. No. 33					
Part II *Sanitation of the Harvesting and Processing of Shellfish,* 1965 revision. PHS Pub. No. 33					
Part III Public Health Service *Appraisal of Shellfish Sanitation Programs,* 1965. PHS Pub. No. 33					
i. Laws and Regulations for Control of Health Hazards as Related to Other Foods (Eggs, Dry Milk, Meat, Infant Formulae, Shellfish, Other Fishery Products)					
j. Educational Programs and Regulations for Assuring Adequate Nutrition					
(1) To overcome dietary deficiencies					
(2) To exert positive influence for good health					

Components of Environmental Health Planning Program	Start (Date)	Finish (Date)	Adoption by Health Plg. Agency* (Date)	Adoption by Physical Development Plg. Agency** (Date)	Start Periodic Review*** (Date)
12. Vector Control Regulations					
a. Insect Vector and Rodent Control Provisions of: (1) Housing Code					
(2) Solid Wastes Disposal Ordinance					
(3) General Sanitation Ordinance					
b. Rodent Control Ordinance					
c. Mosquito Control Ordinance (Local or State)					
(1) Encephalitis — Culex tarsalis mosquito (2) Yellow fever — Aedes aegypti mosquito (3) Malaria — Anopheles (strains) mosquito d. Mosquito Abatement District					
e. Fly Control Ordinance					
f. Dog and Cat Control Ordinance					
g. Rabies Vaccination Law					
h. Dog License Law					
i. Dog Leash Law					
13. General Nuisance Ordinance					
14. State Sanitary Code — General Power to Regulate Sanitary Conditions					
15. Noise Control a. Noise Control Ordinance					
b. Zoning Ordinance: Industrial Performance Standards on Noise					
c. Uniform Soundproofing Code					

* Resolution of adoption should include certification of compatibility with completed portions of the comprehensive state health plan, as an aid to establishing eligibility for Federal aid for comprehensive public health services under Sec. 314(d) of the Public Health Service Act, as amended by P.L. 89-749.

** The physical development planning agency may adopt certain portions only of some plan elements and plan-implementing measures, omitting, for example, personal health services included in the plan element. In a multi-jurisdictional area, where certain conditions are met, it may also assist in joint Federal funding of the EH planning program through joining of Federal urban planning assistance grant funds with Federal comprehensive health planning grant funds, as directed in U. S. Budget Bureau Circular A80 of January 31, 1967. All plan elements supported by joint funding should be subject to dual or joint approval and adoption.

*** Maximum time from adoption to start of first periodic review — five years. Review may result in general reaffirmation rather than massive revision.

[1] Travel trailers, motor homes, tent campers, pick-up coaches, etc.

16. Under which conditions is public water required by the Health Department? (Enter check or appropriate figure if item describes conditions; otherwise enter dashes.)

	For New Subdivisions	*For Single Homes*
a. In all cases		
b. When available within	feet	
c. For lot sizes smaller than	acre	
d. When wells are unsafe		
e. No regulations		
f. Other		

17. Testing of public water supplies
   a. Agency testing public water supply samples
   b. Frequency of sampling
   c. If other than local health agency, does Health Department receive copy of test reports?

18. Regulation of on-lot water supplies
   a. Are specific regulations in effect?
   b. Are they enforced?
   c. Are new wells inspected at time of construction?
   d. Are private water supply samples tested?
      (1) On request
      (2) Routinely
   e. Total number of private water supplies
   f. Number of new supplies installed annually

19. Is refuse storage regulated?

20. Are enclosed trucks required?

21. Refuse disposal (Any open disposal site not covered with earth daily is considered an open dump)
   a. Are there any private or public open dumps in the area?
   b. Is there a regulation prohibiting open dumps?
   c. Does the health department inspect the disposal facilities?

22. Under which conditions are public sewers required by the Health Department? (Enter check or appropriate figure if item describes condition; otherwise enter dashes.)

	For New Subdivisions	*For Single Homes*
a. In all areas		
b. When available within	feet	
c. For lot sizes smaller than	acre	

d. When septic tanks will not work ....

e. No regulations ....

f. Other ....

....

23. Are privately-owned interim sewage treatment plants permitted? ....

a. Are they correlated with a master sewerage plan? ....

How? ....

....

....

b. Who is responsible for their maintenance? ....

....

....

c. Has maintenance been generally satisfactory? ....

....

d. What assurance does the Health Department have of adequate maintenance? ....

....

....

24. Regulation of individual disposal systems (septic tanks, seepage pits or other):

a. What agency passed the regulations? ....

b. Are percolation tests required? ....

Performed by: (1) Above agency ....

(2) Registered engineer ....

(3) Individual ....

c. Are soil maps used? ....

d. Are deep soil tests used? ....

e. Average annual number of septic tank complaints ....

f. Total number of septic tanks in use (approx.) ....

25. Residential environmental standards and regulations, and their enforcement:

a. What agency is responsible for a Housing Maintenance and Occupancy Code? ....

....

b. Does that Code conform to the standards suggested in the *APHA-PHS Model Housing Maintenance and Occupancy Ordinance* (rev. 1967)? ....

(1) In what particulars does the Code not meet the minimum standards in Section 3 of the Model Ordinance, "Responsibilities of Owners and Occupants"? ....

....

(2) In what particulars does the Code not meet the minimum standards in Section 4 of the Model Ordinance, "Minimum Standards for Basic Equipment and Facilities"? ....

....

3. In what particulars does the Code not meet the minimum standards in Section 5 of the Model Ordinance, "Minimum Standards for Light and Ventilation"? ....

....

4. In what particulars does the Code not meet the minimum standards in Section 6 of the Model Ordinance, "Minimum Thermal Standards"? ....

....

5. In what particulars does the Code not meet the minimum standards in Section 7 of the Model Ordinance, "General Requirements Relating to the Safe and Sanitary Maintenance of Parts of Dwellings and Dwelling Units"? ....

6. In what particulars does the Code not meet the minimum standards in Section 8 of the Model Ordinance, "Maximum Density, Minimum Space, Use and Location Requirements"? ....

....

7. In what particulars does the Code not meet the minimum standards in Section 9 of the Model Ordinance, "Rooming House"? ....

c. What agency administers and enforces the Code and its related rules and regulations? ....

1. Are the administrative procedures that agencies use in respect to entry, inspection, orders and hearings modeled after those proposed in the Model Ordinance? ....

....

2. Wherein do they differ? ....

d. What agency issues licenses or permits:

1. For rooming houses? ....

2. For multi-family dwellings? ....

3. For mobile home parks? ....

e. Does the Health Department participate in review approval of subdivision plans? ....

....

1. What agency checks subdivision plans for water and sewer purposes? ....

....

2. What agency checks subdivision plans in respect to adequacy of common open spaces:

Indoor? ....

Outdoor? ....

Private? ....

Public? ....

3. Does the Health Department check the covenants, positive and restrictive, pertaining to any Homes Association which would own common spaces appearing on the plat to ascertain the adequacy of the covenants and related easements to protect the public interest in the continuance of the common spaces and the adequacy of the assessment for financing the Home Association so it can fulfill later Department orders regarding maintenance and housing? ....

....

f. Has the Health Department reviewed the building code to assure its standards meet the minimum standards for residential hygiene expressed in the Housing Maintenance and Occupancy Code? ....

....

g. Does the Health Department consult on zoning matters to assure that adequate common space standards for recreation and leisure-time activities are attained in neighborhoods as density increases? ....

h. Is the Health Department consulted on, or does it review, urban renewal plans to assure that adequate neighborhood common space standards for recreation and leisure-time activities are applied to renewal projects? ....

i. Does the Health Department apply such common space standards for recreation and leisure-time activities in code enforcement, conservation, or rehabilitation programs and plan for appropriate public investment to correct deficiencies? ....

j. Does the Health Department administer a program for assuring sanitation on recreational facilities, parks, playgrounds, swimming pools, etc? ....

k. What is the Health Department doing about noise control?

(1) At the community level? ....

(2) At the neighborhood level? ....

(3) Between dwelling units in multi-family housing? ....

HEALTH AGENCY OPERATIONS — EVALUATION GUIDES

HEALTH AGENCY

All parts of the study area should be served by a local health department. Local (municipal or county) health units are usually able to offer more day-to-day attention to local needs than is possible when environmental health services are provided by the State. In general, one large health department can perform more specialized functions than a multiplicity of smaller ones. In any case, all health departments should be large enough to support a full-time professionally trained staff. Economically, therefore, the minimum population of the health jurisdiction should not be less than 35,000 and preferably 50,000 or more.

STAFFING

Modern comprehensive environmental health programs require a variety of professional disciplines and a multitude of professional skills. While it is difficult to suggest a personnel-population ratio due to the variations which are found in the scope of local environmental health programs as well as the environmental health problem in a particular locality, effective environmental health programs will usually require professional environmental health personnel in the ratio of 1 to 5,000 people.

SALARY

The salary levels necessary to recruit and retain competent professional environmental health personnel may vary considerably from one region of the country to another. Therefore, it is impossible to suggest necessary minimum salary levels. Professional environmental health personnel such as engineers and sanitarians should receive salaries commensurate with that of other professional personnel in the region. In addition, the employing agency should consider the fact that professional environmental health personnel are involved in planning, promotion, administration, budgeting, and enforcement activities. This wide variety of skills may require additional financial rewards.

ENVIRONMENTAL HEALTH PLANNING

Every health department should have an environmental health planning activity, tailored in size to the size of the health jurisdiction, the ex-

HEALTH AGENCY OPERATIONS — SUMMARY CHART

Name of Health Agency	STAFF							BUDGET	
	Sanitary Engineers		Sanitarians		Health Educators		Number of People Served Per Staff Member	Total Dollars	Dollars Per Capita
	Number	Monthly Salary Range	Number	Monthly Salary Range	Number	Monthly Salary Range			

tent and severity of environmental health deficiencies, and the potentialities of the local environment for contributing positively to healthful individual and family living.

When a comprehensive health planning activity is established, environmental health planning should be fully coordinated with personal health planning for physical and mental health. Until that time, environmental health planning can be organized on the basis of cooperation between health agency engineers and sanitarians, staff of other agencies dealing with environmental matters having health aspects (sanitary commission, sanitation department, building department, etc.) and local physical development planners.

Probably a majority of the elements of an environmental health plan should be prepared as an interdepartmental and interagency effort. Some may be developed by the health department alone, such as the milk and food control plan. Some may be prepared by the physical development planners alone, such as the water supply plan.

In any case, it is the responsibility of the health agency to see that adequate planning effort, by whomever expended, is devoted to each element of the environmental health plan, for the purpose of promoting and protecting the public health.

WATER CONNECTION REQUIREMENTS

There should be requirements for connection to public water service to aid in the orderly planning and financing of water service systems. This is discussed in more detail in subsequent guides under Public Water Supply. The health department may find such regulations useful as a means of eliminating or preventing unsatisfactory private water supply installations in cases where public service is or could be made available.

WATER TESTING

A recommended minimum standard suitable for local areas is given in *Public Health Service Drinking Water Standards.*

ON-LOT WATER SUPPLIES

Regulations should be in effect which establish minimum construction standards for private water supplies. Standards should meet State and Public Health Service recommendations. (See *Individual Water Supply Systems,* PHS Publication No. 24) They should require at least an initial quality sample. The licensing of well drillers is recommended as a means of regulating well construction in the community. Although routine inspection and sampling may be so time-consuming as not to be warranted in some areas, the practice is encouraged where possible.

SOLID WASTES ORDINANCES

Regulations or ordinances controlling solid wastes collection and disposal should be adopted throughout the study area. Suggested ordinances suitable for adoption by local health agencies are given in *"Refuse Collection and Disposal for the Small Community"* a joint study and report of the U. S. Department of Health, Education, and Welfare, Public Health Service, and the American Public Works Association.

SOLID WASTES STORAGE

Standards for the storage and removal of solid wastes from individual premises should be enforced by the health department. These standards should include requirements for removal of refuse to prevent nuisance conditions. They should also specify the construction, size, and covering for refuse containers.

SOLID WASTES COLLECTION

Enclosed trucks should be required by the health department to prevent nuisance conditions caused by blowing and scattering of truck contents. The licensing of refuse haulers is recommended to assure the use of proper equipment.

SOLID WASTES DISPOSAL

The use of open dumps and open burning should be prohibited by health department regulation. Routine inspection of disposal sites is recommended to assure that proper disposal practices are being used.

SEWER CONNECTION REQUIREMENTS

To bring about the connection of residences with public sewerage systems where such systems are or could be made available, the health department should have regulations governing the conditions under which public sewer connection is mandatory.

INTERIM SEWAGE TREATMENT PLANTS

The health agency should have a definite policy regarding the use of interim sewage treatment plants. These plants are sometimes used to provide service during transitional periods before an area's population density warrants connection to a central treatment facility. Use of interim plants should be based on assurance of continuity in providing adequate maintenance. This can be accomplished by having a local governmental entity assume responsibility for maintenance, by public utility commission licensing of the operation with a service charge arrangement, or by use of a performance bond, with plant operation by a private concern.

The sewer system for such plants should be correlated with the master sewerage plan for the area. This allows eventual integration of the sewer system into a future arterial system with the assurance that sizes, slopes, etc. will conform to later needs without additional expense.

Maintenance of prescribed water quality in the receiving stream is essential.

ON-LOT SEWAGE DISPOSAL

1. Enforcement Agency. A local enforcement agency should be responsible for regulating on-lot sewage disposal. Separate agencies operating in the same region often have different regulations, with the result that builders and homeowners have no uniform policy for guidance.

2. Percolation Tests. Soil precolation tests are recommended as a means of evaluating the ability of the soil to absorb the wastes. Except for areas where soil conditions are known from experience to be totally unsatisfactory for this purpose, regulations should call for such a test.

Testing should be done by trained, unbiased persons and a recommended testing procedure (see *Manual of Septic-Tank Practice,* PHS Publication No. 526) should be followed, as "short cuts" often lead to erroneous results.

3. Soil Maps. The use of accurate soil maps is suggested to evaluate soil conditions as an adjunct to the more precise percolation tests. Use can also be made of soil maps to determine the general soil characteristics in an area. These maps are available for most areas from the local soil conservation office of the U. S. Department of Agriculture or from the U. S. Geological Survey.

4. Deep Soil Tests. A deep soil test is needed to determine subsurface characteristics, and such a test should be part of the local regulations. Proper septic tank performance cannot be expected if interference is encountered from a high water table (within 4 feet of the ground surface) or from rock or other impervious strata within 4 feet of the trench bottom.

5. Septic Tank Failure Rate. An indication of the septic tank failure rate may be obtained by determining the number of septic tank complaints per year as compared to the total number of septic tank installations. The complaint rate is usually much lower than the actual number of cases where septic tanks do not function properly. A complaint rate of 1 percent or more usually indicates fairly widespread failures.

AIR POLLUTION

It is generally desirable that the responsibility for community air pollution activities be lodged in one of the departments of the local government. Where the responsibility is unassigned, local health departments are encouraged to assume this responsibility, at least in the initial stages. One of the first things to be done in air pollution is to study and assess the situation locally so as to determine what steps or means are needed to combat any problems. Technical assistance can usually be obtained in an initial study and assessment from State Health Departments or from the Public Health Service on request.

RESIDENTIAL ENVIRONMENT: HOUSING AND NEIGHBORHOODS

Many local agencies have responsibilities in connection with bringing about and maintaining healthful conditions in the residential environment.

Health Departments should see that any conditions contributing to unhealthful residential environment are recognized, and should take, or help the responsible agency take, corrective and preventive steps. From a health point-of-view it is now recognized that there is an intimate interrelationship between conditions in and use of dwelling units and conditions in and use of the neighborhood. In this context, a neighborhood is defined as a 10-minute radius for pedestrian circulation from a dwelling unit, inclusive of time on stairs or elevator. Both physical and mental health considerations require the ability to alternate dwelling space and neighborhood space.

Several guides are available to describe residential environmental needs, including: the APHA publication, *Basic Principles of Healthful Housing,* the APHA-PHS *Model Housing Maintenance and Occupancy Ordinance* (revised 1967), the APHA *Planning the Neighborhood* (APHA-PHS revision forthcoming), some of the Technical Bulletins of the Urban Land Institute such as T.B. No. 50, *Homes Association Handbook,* and a number of manuals prepared by the Office of Urban Environmental Health Planning, National Center for Urban and Industrial Health, Public Health Service, and by the Department of Housing and Urban Development.

B. PHYSICAL DEVELOPMENT PLANNING AGENCY OPERATIONS

This section is designed to point out the number, jurisdiction, powers, and the status of work of physical development planning agencies in the study area, including the status of those functional elements of physical development plans which are of particular concern in achieving and maintaining high and positive levels of environmental health.

PHYSICAL DEVELOPMENT PLANNING AGENCY OPERATIONS— DATA FORM

1. Has the state legislature adopted state enabling acts for local planning and zoning by cities, counties, and other local political jurisdictions? ....

2. Do the state enabling acts for local planning and zoning need modernization? ....

3. Has the state legislature adopted a state enabling act for metropolitan or regional planning? ....

   Identify ....

4. Does this act need modernization? ....

5. Has each local political jurisdiction in the study area which is empowered to do so adopted a local planning ordinance and created a local physical development planning agency? (Show areas of planning jurisdiction on map.) ....

6. Has each local political jurisdiction in the study area which is empowered to do so adopted a local zoning ordinance? (Show zoned areas on map.) ....

7. Do these local planning and zoning ordinances take full advantage of the powers authorized in the state enabling acts? ....

8. a) Does the metropolitan or regional area have a metropolitan regional or other regional (subdivision of the state) physical development planning agency? ....

   b) Does the metropolitan or regional planning agency possess all the powers authorized by the state enabling act for metropolitan or regional planning? ....

For each planning agency (metropolitan, regional, city, county, other) in the study area, answer the following questions:

9. Is the planning agency official? ....

10. Is the planning agency established on a statutory basis, that is, under provisions of law? ....

    ....

11. Is the planning agency established on a permanent basis? ....

12. Is the planning agency staffed with trained professional planners? ....

13. Does the planning agency have assured annual funding derived from a fixed rate of tax applied to assessed valuations within its area of planning jurisdiction? ....

14. Does the planning agency have a planning program scheduled over a period of time to produce a study design, functional plan elements, a long-range, integrated, comprehensive physical development plan, and plan implementation measures, as detailed below? ....

PLANNING PROGRAM[1] FOR PREPARATION OF A PHYSICAL DEVELOPMENT PLAN

Components of Physical Development Planning Program	Starting Date	Completion Date	Prepared by Physical Plg. Agency	Prepared by EH Plg. Agency	Prepared jointly by EH & Phy. Dev. Plnrs.	Date adopted by Phy. Plg. Agency	Date adopted by Env. Health Plg. Agency[2]	Date scheduled for review
			Check one					
A. Study Design								
B. Functional Plan Elements[1,3,4]								
1. Land Use Plan								
a. Residential								
b. Industrial*								
c. Commercial*								
d. Park and Recreation								
e. Open Space								
2. Highway and Transportation Facilities Plan[5]								
a. Highway								
b. Air								
c. Rail*								
d. Water*								
e. Mass Transit								
3. Community Facilities Plan								
a. Water								
b. Sewer								

Components of Physical Development Planning Program	Starting Date	Completion Date	Prepared by Physical Plg. Agency	Prepared by EH Plg. Agency	Prepared jointly by EH & Phy. Dev. Plnrs.	Date adopted by Phy. Plg. Agency	Date adopted by Env. Health Plg. Agency[2]	Date scheduled for review
			Check one					
c. Flood Control								
d. Schools*								
e. Hospitals and Medical Facilities								
f. Libraries								
g. Other Public Buildings*								
h. Solid Wastes								
C. Long-range integrated, comprehensive physical development plan.								
D. Implementing Measures								
1. Zoning Ordinance Text and Map								
2. Subdivision Regulations								
3. Capital Improvements Program (Long range fiscal plan for indefinite time period showing project priorities and general costs)								
4. Capital Improvements Budget (Definitive financing plan for projects in early years of above)								

[1] Developed in part with assistance of Department of Housing and Urban Development.

[2] The Environmental Health Planning Agency may wish to adopt certain elements of the approved physical development plan as acceptable portions of the environmental health plan, and certify their compatibility with completed portions of the comprehensive state health plan, as an aid to establishing eligibility for Federal aid for comprehensive public services under Sec. 314(d) of the Public Health Services Act, as amended by P.L. 89-749.

[3] This list does not attempt to identify all work elements of a planning program that should be included in a study design. Notable exclusions are goals, objectives, criteria, standards, etc.

[4] Certain functional plan elements or parts thereof covering details of local development may not be appropriate for inclusion in a metropolitan plan, due to factors of scale.

[5] Health concerns in transportation relate to (1) health and safety of the traveler, (2) blighting effects of transportation systems on peaceful enjoyment of the urban habitat (neighborhood intrusion, noise, air pollution, pedestrian safety) and (3) movement needs to sustain individual life patterns (access to employment, recreation, etc.)

* Primarily by physical development planning agency, although environmental health planners may contribute.

PHYSICAL DEVELOPMENT PLANNING AGENCY OPERATIONS— EVALUATION GUIDES

PHYSICAL DEVELOPMENT PLANNING AGENCY

Any growing community should be actively engaged in planning for its future physical development by supporting a continuing planning process. This process is built around preparation and systematic, periodic revision of a comprehensive physical development plan; but plan-preparation and revision should be supplemented by continuing (1) collection and analysis of data, (2) review of and comment upon proposed public capital improvement projects and private land-use rezoning applications, and (3) review and approval of subdivision plats creating new urban fringe growth. Effective planning usually requires qualified, full-time planning personnel. However, smaller communities may find that planning consulting services are more suitable than full-time local professional planning staff. Such services are generally provided by private planning consulting firms which assist large and small communities alike; but, in many areas, county, metropolitan, or state planning agencies are also available for consulting assistance to localities. In any case, each local jurisdiction authorized by state law to exercise planning, zoning and subdivision control powers should have its own planning agency to deal with application of the plan to current community growth developments. Planning for adjoining jurisdictions may be coordinated by planning agency cooperation, by joint agency use of a single professional staff, or by creation of a metropolitan planning agency. Every metropolitan area large enough to be a Standard Metropolitan Statistical Area should be served by a metropolitan or sub-state regional planning agency. The growing number of Federal aid programs being related to metropolitan planning activity by the Congress makes metropolitan planning a practical necessity for metropolitan areas wishing to utilize various Federal aids.

COOPERATION OF PLANNING AND HEALTH AGENCIES

Public health activities can often be benefited by determining future needs and developing plans for best anticipating and meeting these needs. In doing this, many of the techniques used by planning agencies are equally applicable to health agency use. Some of the key elements of a physical development plan, particularly the water supply and sewerage elements, have as their basic purpose the preservation and promotion of the public health. Many of the elements of an environmental health plan contain land use and physical construction programs which can quite properly be officially adopted by the planning agency and incorporated into its comprehensive plan. Other programs proposed in various elements of an environmental health plan may deal with governmental services, rather than physical facilities, and under existing planning enabling legislation may be outside the authority of the physical planning agency to prepare or adopt. In these circumstances very close cooperation between the physical development planning agency and the environmental health planning activity is essential. The nature of these cooperative efforts is likely to be flexible and varied. Some plan elements will be prepared by one group, some by the other, and some by both in a joint effort. Still other plan elements will require for their preparation the participation of one or several additional governmental agencies, for example, the Corps of Engineers for a flood control plan, the Soil Conservation Service for a sedimentation control plan, and local public works and traffic engineering departments for automotive injury control planning.

SUBDIVISION AND ZONING REGULATIONS

The area and type of soil required for on-lot sewage disposal and on-lot water supply should be a factor in regulating present lot size requirements and in future planning. Subdivision regulations are particularly valuable as a means of assuring the provision of adequate sanitation facilities. Many planning agencies now refer all proposed new subdivision plats to the health department for a review of the adequacy of methods for private water supply and private sewage disposal. While this is very helpful in preventing the acceptance of plats where wells or septic tanks are proposed, but are not suitable, some communities have had even more success through the formation of subdivision review committees. By having a joint review of plats with the agencies responsible for public utilities as well as public health, the economic and construction factors can also be considered and more efficient planning of services may be possible.

Zoning standards are also useful to aid in the development of salubrious neighborhoods, to prevent high population densities in areas not supplied with adequate health-related utilities, and to prevent future slum conditions.

COMMUNITY FACILITIES PLAN

A number of environmental health concerns are closely linked with public utilities and related service facilities, which in turn are related to the land-use pattern for planning and the capital improvement program for execution. In the development of land-use plans and capital improvement programs, the health department can provide much assistance. By the same token, the developed plans will serve to guide environmental health planning in conformity with overall community needs and objectives. The health agency, through a comprehensive environmental health plan, can take an active part in helping to formulate the pattern of community development.

LAND USE AND FLOOD PLAIN PLANNING

Open land on the fringe of urban areas is being swallowed up at a fantastic rate, as much as a million acres each year. As land becomes used up, more and more marginal property comes under development and flood hazard maps of the area can serve a vital information purpose. Future home owners, builders, developers, industrialists, and others are put on notice about the flood hazards existing in areas which they may have under consideration. The community itself can enact regulations governing the development and use of these flood plains to minimize both the physical damage and the accompanying serious health hazards from future floods. Properly regulated flood plains need not be just vacant waste lands but can be put to many uses consistent with the ever-present reality that they are subject to flooding. They can be developed for recreational uses as parks and woodlands, and marginal business areas can be used to provide badly needed parking lots close to the main business section. A typical flood hazard map is shown in the Appendix.

C. AIR POLLUTION CONTROL

This questionnaire is designed to gather information for the assessment of air pollution and the community resources presently being used to solve the problems. Fill in all squares using X for no and √ for yes.

AIR POLLUTION CONTROL — DATA FORM

AGENCIES TO BE INTERVIEWED FOR INFORMATION.

A. ☐ Air pollution control agency
B. ☐ Licensing Bureau
C. ☐ Planning-Zoning agency
D. ☐ Weather Bureau or airport meteorologist
E. ☐ Other (specify) ....

Agency interviewed .... Address ....

Person interviewed .... Telephone number ....

1. Effects Noted (by agency personnel and by public complaints received)
   - a. ☐ Damage to structures: (1) ☐ Corrosion, (2) ☐ Discoloration, (3) ☐ Dirt accumulation (4) ☐ Other (specify) ....
   - b. ☐ Damage to crops (specify) ....
   - c. ☐ Eye, nose, or throat irritation: (1) ☐ Pollen, (2) ☐ Other (specify) ....
   - d. ☐ Soiling: (1) ☐ Clothing, (2) ☐ Household furnishings, (3) ☐ Other (specify) ....
   - e. ☐ Reduced visibility
   - f. ☐ Odors (specify) ....
   - g. ☐ Property devaluation
   - h. ☐ Other (specify) ....

2. Air Pollution Sampling
   - a. ☐ Air monitoring program in operation (show sampling station locations on air pollution map, page 95.)
   - b. ☐ Particulate sampled: (1) ☐AISI; average level[a], ☐ <0.5[b], ☐ 0.5-1.2, ☐ 1.2-2.0, ☐ >2.0 (2) ☐ Hivol; average level[c], ☐ <80, ☐ 80-110, ☐ >110 (3) ☐ Dustfall; average level[d], ☐ <15, ☐ 15-25, ☐ >25
   - c. ☐ Gases sampled. (1) ☐ Sulfur dioxide; average level[e] ...., method .... (2) ☐ Oxidant; average level[e] ...., method .... (3) ☐ ....; aver. level[e] ...., method .... (other, specify)
   - d. ☐ Other samples taken, average level[e], method ....
   - e. ☐ Laboratory facilities; (1) ☐ Control agency, (2) ☐ Local contract, (3) ☐ Non-local, (4) ☐ Sufficient

---

[a] Units: Cohs per 1000 linear feet
[b] > greater than < less than
[c] Units: Micrograms per cubic meter
[d] Units: Tons per square mile per month
[e] Units: Parts per million unless otherwise specified

3. Meteorology

☐ Parameters measured (write number of years of record in box): (1)☐ Wind direction, (2)☐ Wind speed, (3)☐ Temperature, (4)☐ Visibility, (5)☐ Inversion frequency, (6)☐ Other (specify) ....

....

4. Pollutant Emission Sources (if possible, obtain proportional estimates for emissions listed)

Community Sources	Parti-culate	SO_2	NO_x	HC	Odors	Other	Industrial Sources	Parti-culate	SO_2	NO_x	HC	Odors	Other
☐ Automobiles							☐ Gas-heating						
☐ Buses							☐ Road mix plts.						
☐ Open-burning							☐ Power plants.						
☐ Incineration							☐ Solvent use						
☐ Sewage							☐ Petro. stor.						
☐ Power plants							☐ Auto-burning						
☐ Coal-heating							☐ Other (list below)						
☐ Oil-heating													

☐ Locate major sources on air pollution map, page 95.

5. Legislation and Control Program

a. ☐ Specific air pollution control legislation adopted: (1) ☐ Enabling type, (2) ☐ Regulatory type

b. ☐ Permit system: (1) ☐ New and/or altered installations, (2) ☐ Operating installations

c. ☐ Emission control regulations: (1) ☐ Ringelmann # (specify) ....
(2) ☐ Particulate (specify) ...., (3) ☐ Other (specify) ....

d. ☐ Show area covered by legislation and control agency(s) on air pollution map, page 95.

e. ☐ Advisory board for air pollution: (1) ☐ Duties and membership (specify)

....

f. ☐ New installations inspected before operation

g. ☐ Old installations inspected: (1) ☐ Semiannually, (2) ☐ Annually, (3) ☐ Biannually, (4) ☐ Other

....

h. ☐ Operators of principal sources of air pollution contacted personally

i. ☐ Long-range abatement plan developed: (1) ☐ By whom ...., (2) ☐ When ....

j. ☐ Monthly complaint record: (1) ☐ Average # per month ...., (2) ☐ Investigation response time

....

6. Urban Planning and Zoning for Air Pollution Control

a. ☐ Zoning includes areas for industries likely to produce air pollution

b. ☐ Zoning separates industrial and residential areas sufficiently to reduce local air pollution effects

c. ☐ Zoning does not allow residential construction in industrially zoned areas

d. ☐ Contact maintained with air pollution control agency: (1) ☐ Formal continuing basis, (2) ☐ Informal basis

e. ☐ Meteorological data are utilized for evaluating new industrial parks and other industrial areas

f. ☐ At least one planning agency staff member has received training in air pollution topics

AIR POLLUTION CONTROL — SUMMARY CHART

AGENCY NAME	EFFECTS NOTED (Indicate as significant, minor, or none)							Regulations established	Authorization required for new installations	Monthly complaint rate	Long-range plan	Sampling program conducted
	Damage to structures	Damage to crops	Eye, nose and throat irritation	Particle fallout and property soiling	Reduced visibility	Odors	Other					

AIR POLLUTION CONTROL—EVALUATION GUIDES

AIR POLLUTION PROBLEMS

The basic question "What are our air pollution problems" can be answered by considering the effects of air pollution, measurements of ambient air pollutant concentrations, and the magnitude of emissions from known sources. Problem pollutants usually become apparent through their effects as reported to local agencies. The first-hand knowledge of health and air pollution control officials and complaint records maintained by local agencies are very useful especially if they are easily evaluated and easily tabulated. Evaluation of air pollution sampling and measurement done in the past can be valuable in ascertaining the extent of various air pollution problems and the degree of the problems as assessed against pollution concentrations occurring in other communities. After effects and pollutant concentrations have been noted, careful consideration of the relative magnitudes of various emissions from known sources will be useful in defining the relative importance of sources causing air pollution problems. The Air Pollutant Resume on page 33 gives a general evaluation of problem pollutants that are common to our cities. Although some problems are readily apparent in some communities, it is *always* best to assess carefully all information that can be brought together. The data form on pages 29-30 is for this purpose.

LEGISLATION AND CONTROL PROGRAMS

To answer the question "Is our government trying to solve our air pollution problems?" existing laws, ordinances, rules, and regulations for the control of air pollution and the control programs consequently established should be evaluated. The existing patterns of laws and regulations vary from the long-established smoke and particulate matter regulations to more modern regulations that have been developed to combat new and varied air pollution problems now occurring in many areas. Emission regulations are the foundation of all regulatory programs. To assure that compliance is attained, permit systems are used. Most modern legislation includes both program elements as being inseparable parts of an effective control program.

Several of the major metropolitan areas of the United States are now utilizing a new concept, air resource management, in which emission regulations are based on emission reductions needed to reach specified air quality levels. These levels are the goals selected to prevent effects such as health or vegetation damage. Also, in the past, the part played by urban planning and zoning in the prevention of air pollution problems has not been widely utilized by either planners or control agencies. The Guide's air pollution data form can be useful in determining the weaknesses of existing legislation and regulatory programs.

PROBLEM EVALUATION

After determining what air pollution problems exist (or may exist in the future) and what has been and is being done to solve such problems, what is or will be needed to solve the air pollution problems and how such needs can be met must be determined.

An air pollution advisory committee consisting of five to ten *active, interested* members can be effective in developing community support for an effective control program even where no legislative action has been taken to establish a specific air pollution control authority and/or no effective control program exists.

An effective air pollution control program should include complaint investigation, ambient air-quality monitoring, source control, and a continuing evaluation of the factors affecting air quality. Prevention is the keynote of air pollution control. The main preventive tools are planning and zoning used to separate sources from receptors; active and recurring personal contact with major source operators by which emission reduction plans are developed; an intimate knowledge of air pollution sources, transport and effects; and the permit system in which review and approval of plans for new installations and major alterations on existing installations and inspection and approval of existing installations are required. The registration of air pollution sources, without permit requirements, can serve as a running inventory of sources and can be used to make operators conscious of the importance of air pollution control.

Personnel and funding are primary problems for most air pollution control programs and should be of primary concern to those studying solutions to air pollution problems. Special attention should be given to assistance available from state agencies and the Federal government.

AIR POLLUTANT RESUME

Type of Pollutant	Effect	Source	Possible Control Measures	Air Pollution Sampling Method
Fallout Particulate Matter	Soiling of property, nuisance	Industry, combustion processes, road mix plants, incinerators, etc.	Cyclones, bag filters, electrostatic precipitators, washers, etc.	Dustfall sampling Use of glass slides
Suspended Particulate Matter, Smoke	Soiling of property, visibility reduction, nuisance, health effects	Industry, combustion processes, road mix plants, incinerators, etc.	Bag filters, electrostatic precipitators, good combustion practices	1. High Volume Filter Sampler 2. AISI Smoke Sampler 3. Visibility Determinations
Hydrocarbons	Primary contributors to Los Angeles type smog (eye irritation, rubber cracking, visibility reduction, oxidant formation, plant damage).	Automotive vehicles, oil refineries, fuel handling, solvent handling.	Automotive exhaust control devices and blowby devices, floating roof covers, vapor recovery systems	Flame ionization
Oxides of Nitrogen		Automotive vehicles, combustion processes, industry	Automotive emission control devices, controlled combustion	Saltzman method
Oxidant (a measure of Los Angeles smog)	Eye irritation Rubber cracking Plant damage	Photochemical reactions in the atmosphere	Controls for hydrocarbons and oxides of nitrogen	Potassium iodide method
Carbon Monoxide	Toxic pollutant Reduces visual and mental acuity	Automotive vehicles Incomplete combustion	Automotive exhaust devices (under development) Good combustion practices	A modification of the NBS colorimetric detector tube technique
Sulfur Dioxide	Corrosive, odorous, plant damage, health effects	Combustion processes, industry, etc.	Absorption towers, control of sulfur content in fuel	West-Gaeke method
Pollen	Allergy, hay fever	Natural-trees, grasses, weeds, etc.	Farming methods, weed control	Collection on slides
Odors	Nuisance	Industry, sewage and water treatment, open burning, etc.	Good housekeeping, chemical control, masking counteractant, afterburners, etc.	Trained observers Panel of observers Volunteer observers

D. FOOD PROTECTION

The food-protection program in the study area should provide comprehensive coverage for all foods being produced, processed, and/or sold therein. This should include the adoption of adequate laws and regulations and their subsequent uniform interpretation and application throughout the jurisdictions involved.

This section is designed to identify the number and kinds of food establishments in the study area and the specific agencies having jurisdiction; and to set forth special services and certain administrative considerations which are important in the development and maintenance of an effective food-protection program.

FOOD PROTECTION — DATA FORM

1. Foodshed Composition
    a. Number of food service establishments
    b. Population of the area served
    c. Geographical area of food supply

2. Control of Food Sanitation Program
    a. Control is vested in what agency?
    b. Number of people employed in food sanitation activities
    c. What is the legal basis for the program?
    Is the law uniform throughout the State?
    d. Is there a program for the investigation of food-borne disease outbreaks?
    e. Is the water supply serving the food establishments public or private?
    If both, give details:
        (1.) If private, are physical site inspections made for proper location of wells?
        (2.) Are water samples from food establishments analyzed?
    f. Are laboratory facilities available for the microbiological and chemical examination of food from food service establishments?

3. Milkshed Composition
    a. Number of pasteurization plants
    b. Number of producer dairies
    c. Geographical area of the milkshed
    d. Population of area served
    e. Percentage increase or decrease in population last ten years
    f. Percentage increase or decrease in consumption last ten years

4. Geographical Area Expansion of Milkshed
    a. Area available for dairy farm expansion

b. Potential ground or surface water available ....

....

c. Sufficiency of roads to compensate for expansion ....

....

5. Control of the Milk Sanitation Program
   a. Control is vested in what agency? ....
   b. Number of people employed in milk sanitation activities ....
   c. What is the basis for the law? ....

   ....

      (1.) Is the law uniform throughout the State? ....
      (2.) Can raw or pasteurized milk be shipped from one area to another without additional inspection?

      ....

   d. Laboratory responsible for sampling the milkshed ....

   ....

      (1.) Is the laboratory certified by a certifying agency? ....
      If so, by whom? ....
      (2.) What number of samples is analyzed? ....
      (3.) Is the laboratory equipped to assume additional responsibility in sampling? ....
      (4.) Is the laboratory equipped to perform both bacteriological and chemical analyses? ....
      (5.) Does the laboratory analyze water samples taken from dairy farms? ....

      ....

6. Supervision and Organization of the Milk and Food Program
   a. What is the organizational structure of the Milk and Food Program? ....

   ....

   ....

   b. Is supervision and technical consultation given by another agency? ....

   ....

   c. Is there a program of training for the milk and food personnel? ....

   ....

      (1.) If so, who is responsible for training? ....
      (2.) Is training uniform throughout the State? ....
      (3.) Is sufficient training given to minimize lack of technical information? ....

      ....

7. How and by which agency are food processing establishments regulated in the community? (See Summary Chart). ....

8. Do the several food-control agencies coordinate their activities to reduce duplication and increase efficiency?
   Yes .... No ....

9. If more than one health agency has jurisdiction in the study area, are their food-sanitation requirements similar? Yes .... No .... Do survey results indicate that these requirements are uniformly enforced? Yes .... No ....

10. Do institutional and food-industry representatives participate in planning the food-protection program?

Yes .... No ....

11. Are food-protection courses for food-industry management conducted by the control agencies?

Yes .... No ....

12. Does food-industry management sponsor training courses in food protection for their employees?

Yes .... No ....

13. Has the food-service sanitation program been evaluated by the responsible State agency in the past two years? Yes .... No .... When ....

What agency .... Most recent ratings: Sanitation level ....

Administrative level ....

14. Has the milk supply been rated by an official agency? Yes .... No .... When ....

.... What agency .... Most recent rating ....

15. Are laboratory services available for bacteriological and chemical analyses of official food samples from food processing plants? Yes .... No ....

16. Has the local laboratory been evaluated by an official agency for examination of milk ....;

food ....; shellfish ....? What agency ....

Most recent rating ....

17. Number of milk and foodborne disease incidents in the community in the past three years

	Outbreaks	Cases	Type of establishment
Milkborne			
Foodborne			

18. Have personnel in the state agency which makes the food service program evaluation and the milk ratings been standardized and certified within the past three years by the U.S. Public Health Service?

Yes .... No .... When ....

19. Is training adequate to keep state and local control agency personnel knowledgeable of new methods and techniques in their areas of responsibility? Yes .... No ....

20. Summarize any gaps in the food-protection program outlined in Items 7-19. ....

....

....

....

....

FOOD PROTECTION — SUMMARY CHART

Type of	Number of Establishments	State or Local Law, Regulation, or Ordinance	Responsible Agency	Active Control Program
Food Service				
Public eating and drinking				
Industrial				
Institutions (schools, hospitals, etc.)				
Private (church, club, etc.)				
Non-profit				
Catering				
Temporary				
Machine vending				
Retail				
Groceries				
Meat Markets				
Fish markets				
Bakeries				
Vegetable markets				
Milk and milk products				
Dairy farms				
Pasteurization plants				
Frozen dessert plants				
Drying plants				
Processing plants				
Bakeries				
Convenience foods				
Eggs				
Fish				
Ice manufacturing				
Meat slaughtering				
Meat				
Poultry				
Shellfish				
Soft drink				
Vegetable				
Canneries				
Frozen foods				
Other (specify)				
Warehouses				
Wholesale distributors				

FOOD PROTECTION — EVALUATION GUIDES

The food-protection guides have been designed to determine the various agencies responsible for food protection within the community and to reveal any major deficiencies in control programs.

AGENCIES INVOLVED

The several types of food industries are often regulated by more than one agency. Responsibility for sanitary control of certain types of foods is often restricted by law to a specific agency. In metropolitan areas there also may be several local health jurisdictions with differing food-protection requirements and policies. In evaluating the total food-protection program, care should be taken to see that particular attention is given to the protection of all "potentially hazardous food." Where several control agencies are involved, it is still possible that certain areas may not be adequately covered, and in others there may be wasteful duplication of effort.

LAWS AND REGULATIONS

Consumer protection through the application of sound public health principles is a basic responsibility of public health agencies. Food-protection programs, however, are often only as effective as the written regulations they uphold. Suggested ordinances suitable for adoption by State and local jurisdictions are given in PHS Publication No. 934, *Food Service Sanitation Manual*, 1962; PHS Publication No. 229, *Grade A Pasteurized Milk Ordinance*, 1965; PHS Publication No. 546, *The Vending of Food and Beverages*, 1965; and PHS Publication No. 1183, *Sanitary Standard for Manufactured Ice*, 1964.

SCOPE OF THE PROGRAM

The complexities arising from multiple ingredients, processes, and types of contamination make food protection a particularly difficult area of public health. A comprehensive food-protection program may require cooperation between two or more agencies, as such a program should include all types of businesses and establishments dealing with food and drink, from production through processing, transportation, and distribution to the final consumer; including facilities operated by churches, institutions, and schools.

An informed public, aware of proper food-protection practices, is essential to assure an effective program.

LABORATORY FACILITIES

Public health laboratory facilities are essential in the promotion and maintenance of a high level of food sanitation. A food-protection activity cannot be complete without access to a properly equipped and functioning laboratory. Since food-protection programs are preventive in nature, laboratory services should be provided for the surveillance of potentially hazardous food as well as the investigation of suspected foodborne disease outbreaks.

INDUSTRY AND INTERAGENCY COOPERATION

Cooperative effort on the part of industry and government is essential to the development and maintenance of an effective food-protection program. A local program must also rely on and cooperate with other agencies involved in food protection, such as adjoining health jurisdictions, State agencies, the U. S. Public Health Service, Food and Drug Administration, and Department of Agriculture.

EVALUATION

One method for evaluating the effectiveness of food-protection measures in the community is to determine the incidence of foodborne illness. This requires the cooperation of local physicians in reporting these incidents to the health agency and effective epidemiological investigations of such reports to determine not only the causative organism, but the food source and its handling and processing history.

A food-protection program should produce and maintain results which are obvious to the community and commensurate with the cost of operation. The program should be evaluated on the basis of accomplishment and future needs rather than upon the basis of work units, number of inspections, or effort. The objectives must be based on a realistic and acceptable level of public health and food sanitation for a particular time and place. There is a need, therefore, for frequent review and evaluation of program needs, objectives, and achievements.

E. PUBLIC SEWERAGE

One of the most useful results of this section is the preparation of the sewerage service map called for under item 3. While such a map may be available locally, experience has shown that it is often not kept current. Also, the maps may be in the form of a number of separate sheets, each showing only a part of the study area. Current information should be condensed and superimposed on one of the previously prepared area maps, such as shown in the example on page 96. If lateral and submain locations are not shown on available maps, the boundaries of the overall service area should be approximated.

PUBLIC SEWERAGE — DATA FORM

1. Name of system (use one set of sheets for each system) ....

   ....

2. What agency operates the system? ....

3. Map—show jurisdiction or "franchise area," service area, location of plants, outfalls, pumping stations.

4. Number of homes served ....

5. Percent (homes served/all homes in area) ....

6. Has a sewerage "master plan" been developed? ....

   a. When? ....

   b. By whom? ....

   c. As part of the area's environmental health plan? ....

      As part of the area's physical development plan? ....

      Under a State law on planning of water and sewer extensions, based on the PHS Model State Act: *Urban Water Supply and Sewerage Systems Act?* ....

      If the latter, does the State law retain the "teeth" of the Model Act? ....

   d. Is it being followed? ....

   e. How often is is up-dated? ....

7. Are there a capital improvements program and a capital budget for major nonrecurring improvements to sewer facilities? ....

8. Is the sewerage system planned for expansion? ....

   How? ....

9. Under what conditions are homes required to connect to existing sewer lines? (Enter check if applicable, otherwise enter dash)

	For New Subdivisions	*For Single Homes*
a. In all cases	....	....
b. Where available within	....	....
c. No regulations	....	....
d. Other	....	....

....

....

System...

10. What criteria govern the extension of lines? (Enter check if applicable, otherwise enter dash)

	Within Corporate Limits	*Outside Corporate Limits*
a. When public funds are available	....	....
b. On petition of homeowners	....	....
c. Master plan schedule	....	....
d. Request of health department	....	....
e. Requires sewer district formation	....	....
f. Other	....	....
g. Population density (Describe definite requirements)	....	....

....

....

....

11. Who pays for sewer line extensions across vacant areas?

a. Agency responsible for the public sewerage system ....

....

b. Developer ....

c. Shared ....

(Describe any special rebate methods)

....

....

....

12. Who pays for lines larger than those needed for current use:

a. Agency responsible for the public sewerage system ....

b. Developer ....

c. Shared ....
(Describe any special rebate methods)

....

....

....

System...

(Items 13 through 17 need not be completed by agencies not operating their own treatment plant.)

13. Design capacity of treatment plant (in m.g.d.) ....

14. Treatment

a. Primary ....

b. Secondary ....

15. a. Immediate receiving water ....

b. Drainage basin ....

16. Does any sewage other than storm water bypass flow directly into the receiving water without treatment?

....

17. Describe any action taken by a state agency against the system because it was polluting a receiving stream.

....

....

....

....

18. Itemize the residential rate structure (for obtaining service originally and for continuing use).

....

....

....

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....

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....

....

PUBLIC SEWERAGE — SUMMARY CHART

NAME OF SEWERAGE AGENCY	SYSTEM OPERATED BY	Number of Homes Served	Master Plan	Capital Improvements Program	Capital Budget	Designed for Expansion	TREATMENT			
							Primary	Secondary	Capacity m.g.d.	Receiving Water

PUBLIC SEWERAGE — EVALUATION GUIDES

SERVICE AREA

Service areas should be based on population density and topography. A multiplicity of small sewage treatment plants indicates a lack of coordinated area planning. The practice of constructing many small plants, each designed to serve only its immediate area, is less desirable and often more expensive than a few large plants designed to serve entire drainage areas. A comparison of the service area map with the map previously prepared for drainage and soil conditions will be helpful in determining (a) most logical locations of treatment facilities and service areas, and (b) areas where public sewerage is most needed due to soil conditions which preclude the proper operations of private septic tank systems.

JURISDICTIONAL AREA

Jurisdictional areas should be related to drainage areas and should reflect anticipated growth patterns.

SEWERAGE MASTER PLAN

A sewerage master plan showing future needs and facilities is necessary in attacking the problem of urban growth. In areas currently without serious problems, such a plan will assist greatly in preventing future problems. Along with the master plan, a capital improvements program (long range financial plan) is needed in which expenditures are allocated for periods of several years. Both the master plan and the capital improvements program should be related to other community needs.

In some jurisdictions, the planning of sewer extensions may be carried on by a sewerage construction and operating agency which does not have authority to do land use and transportation planning; as a consequence, integration of the sewerage plan with other elements of the physical development plan may be weak, non-existent or negative (i.e., direct conflict between uncoordinated plan elements).

In other jurisdictions, local interest or Federal aids may lead to so much emphasis on planning for land use, transportation, urban renewal, etc., that planning for sewerage is delayed or even ignored.

To combat the severe environmental health deficiencies which have arisen under the above circumstances, the Public Health Service has developed a model act for consideration by state legislatures under which the State Health Department could designate existing and potential urban areas for which localities would be required to prepare plans for public water and sewerage geared to expected rate and density of development. After such plans were approved by the State Health Department, issuance of local building permits would be conditioned on provision of water and sewer service to new construction in conformance with such approved plans.

The PHS Model Act is available from your State Health Department or PHS Regional Office as *"Recommended State Legislation and Regulations: Urban Water Supply and Sewerage Systems Act and Regulations, Water Well Construction and Pump Installation Act and Regulations, Individual Sewerage Disposal Systems Act and Regulations"*, July 1965, PHS Publication No. 1451.

EXPANSION NEEDS

A sewerage system which allows flexibility to meet changing conditions is desirable. This can be accomplished by designing sewer sizes to handle both present and future needs, and a treatment plant which will allow expansion at minimum expense. Where economics do not justify large sewer main construction in all areas, temporary pumping stations have been used until population densities warrant permanent trunk line installations.

SEWER CONNECTION REQUIREMENTS

When public facilities are available, connection to such a system should be required, since this allows better system planning. A determination is needed for availability, and a definite distance should be set. Some areas also use a time factor, allowing one to two years before connection is required. Still another system is that of requiring payment of a front foot benefit charge where a line is available, regardless of whether connection is made.

SEWER LINE EXTENSIONS

The community should have a definite policy for determining the method by which service extensions are made. Whatever method is used, it should allow extensions to be made where economic and health factors make this desirable.

The policy should include provision for extension of lines across vacant lots. This requires a decision as to the method of payment or cost-sharing. For over-sized lines designed to serve a large drainage area, a common method is for the government agency to pay the difference in cost between a sewer sized only for the immediate development area and the larger size which will be needed ultimately for the total drainage area.

ADEQUACY OF TREATMENT

The community should provide treatment for all sewage. In urban areas, the discharge of untreated sewage into the environment constitutes a definite health hazard. If such conditions exist, or if the present facilities do not provide treatment of all sewage, steps should be taken toward corrective measures for the community.

RATE STRUCTURE

A determination of total sewerage service costs is useful to compare local system costs with each other and with costs in adjacent areas. Average monthly residential sewerage cost is a convenient basis for this comparison. In some communities sewerage costs are paid from a general fund supported by ad valorem taxes and in this case, an estimate of average monthly residential cost should be made.

In other areas sewerage costs are based on water usage. If this is the case, a standard water consumption figure must be assumed and used throughout the study area for comparison purposes. One thousand cubic feet per residence per month (about 75 gallons per person per day) is suggested for this purpose.

AREAS SERVED

To make the following evaluations the sewerage service map is compared with (1) the present population density map, to determine current service needs and (2) the future population density map, to determine these areas which the future will find most in need of sewerage service. In this connection, there is considerable evidence that, within limits, the construction of new sewer systems to serve anticipated growth areas is often "self-insuring"; that is, the presence of adequate public sewerage facilities attracts home builders and home owners alike to the areas so served and in this way stimulates population growth in these areas. By computing the area provided with sewerage service as a percentage of the total area in each density grouping, the percentage of homes served for each of the population groupings may be determined.

Example:
49.6 sq. mi.—total in study area
7.9 sq. mi.—total area in "over 5,000 persons per sq. mi." density group
6.8 sq. mi.—of this 7.9 sq. mi served by public sewerage service

Therefore: $100 \times \frac{6.8}{7.9} = 86$ per cent of this density group is served

The following chart relates the economic justification of public sewerage service with various population densities. The chart does not necessarily reflect the justification of public sewerage service from a health standpoint, since this cannot be determined except as a judgment factor.

With this limitation, the chart should serve as a "rule-of-thumb" guide for planning purposes. Local characteristics such as topography and subsoil conditions may alter the criteria, which are based on research results for average soil and topographic conditions.

Population Density	*Equivalent Lot Size*	*Service Economic Justification*
Over 5,000 persons/sq. mi.	Less than ½ acre	Public sewerage is justified
2,500-5,000 persons/sq. mi.	½ to 1 acre	Public sewerage is normally justified
1,000-2,500 persons/sq. mi.	1 to 2 acres	Public sewerage is not normally justified
Less than 1,000 persons/sq. mi.	Over 2 acres	Public sewerage is rarely justified

F. PUBLIC WATER

Data for preparing the map under item 3 can be obtained from the water supply agency or from the records of privately operated utility companies. In some cases, it may be necessary to obtain information from the State Public Utility Commission for this item and for items 11 and 12. (As with the maps for sewerage systems, condensation of data may be necessary to show the information on one base map.)

PUBLIC WATER — DATA FORM

1. Name of system (use one set of sheets for each system) ....

   ....

2. What agency operates the system? ....

3. Map—Show jurisdiction or "franchise area" service area, location of plants, source, reservoirs, and pumping stations. (See page 97 for example.)

4. Number of homes served .... % metered ....

5. Percent of homes served .... % metered ....

6. Has a water "master plan" been developed? ....
   - a. When? ....
   - b. By whom? ....
   - c. As part of the area's environmental health plan? ....

     As part of the area's physical development plan? ....

     Under a State law on planning of water and sewer extensions, based on the PHS Model State Act: *Urban Water Supply and Sewerage Systems Act?* ....

     If the latter, does the state law retain the "teeth" of the Model Act? ....
   - d. Is it being followed? ....
   - e. How often is it up-dated? ....

7. Are there a capital improvements program and a capital budget for water facilities? ....

   ....

8. Is the water system planned for expansion? ....

   How? ....

   ....

9. Under what condition are homes required to connect to existing water lines? (Enter check if applicable, otherwise enter dash)

	For New Subdivisions	For Single Homes
a. In all cases		
b. Where available within .... ft.		
c. No regulations		
d. Other		

....

....

....

10. What criteria govern the extension of lines? (Enter check if applicable, otherwise enter dash)

	Within Corporate Limits	Outside Corporate Limits
a. When public funds are available		
b. On petition of homeowners		
c. Master plan schedule		
d. Request of health department		
e. Requires water district formation		
f. Other		
g. Population density (Describe definite requirements)		

....

....

....

11. Who pays for water line extensions across vacant areas?

a. Agency responsible for the public water system..

....

b. Developer ....

c. Shared ....

(Describe any special rebate methods)

....

....

....

12. Who pays for lines larger than those needed for current use: (Do not include lines built only for improving pressure or for fireflow purposes)

a. Agency responsible for the public water system ....

....

b. Developer ....

c. Shared ....

(Describe any special rebate methods)

....

....

....

13. Sources of supply ....

14. Treatment

a. Chlorination ....

b. Other ....

....

....

....

15. Present total reliable source supply (m.g.d. at lowest flow)* ....

....

16. Present total reliable plant capacity (m.g.d.) ....

17. Present storage capacity (finished water) ....

18. Is there usually adequate pressure (30 lb/psi) in all parts of the system? ....

....

....

19. Describe any action taken by a State agency against the system because of the quality or quantity of water.

....

....

....

20. Itemize the rate structure (for obtaining service originally and for continuing use).

....

....

....

....

21. What is the community fire underwriting rating? NB ....

*Obtainable from U.S. Weather Bureau or Geological Survey. Note any proposed dams which may affect supply. For wells, estimate the safe yield from past experience.

PUBLIC WATER — SUMMARY CHART

NAME OF WATER SERVICE AGENCY	SYSTEM OPERATED BY	Number of Homes Served	Master Plan	Capital Improvements Program	Capital Budget	Designed for Expansion	Treatment			Present Total Reliable Source Supply (m.g.d.)	Present Storage Capacity	Adequate Pressure	Monthly Residential Fee	
							Chlorination	Other	Plant Capacity (m.g.d.)				Inside Municipality	Outside Municipality

PUBLIC WATER — EVALUATION GUIDES

SERVICE AREAS

A small number of community water utilities is preferable to a multiplicity of uncoordinated systems. Where practical, interconnection between distribution lines is recommended. A large number of relatively small water companies or municipal departments is often the result of a lack of a coordinated policy for community water resources. Widely different rate systems, insufficient capacity in some areas, and deficient fire protection service can often be traced to these conditions and illustrate the need for an area-wide coordinated plan for water service.

WATER MASTER PLAN

A master plan which shows future needs and facilities in relation to the area's growth and water resources is necessary for effective planning. Such a plan should be developed in connection with a sewerage master plan, and should encompass the long-range watershed needs, storage facilities, and, if appropriate, flood-control plans. Pipe networks, pumping facilities, treated water storage needs, and fire protection demands should also be considered.

Still another factor needed for a good community water program is a long-range financial plan. Both the master plan and capital improvements program should be related to other community needs.

To avoid repetition, and to emphasize the close link between water planning and sewerage planning, the reader is referred at this point to pertinent discussion under Public Sewerage — Evaluation Guides, Sewerage Master Plan.

CONNECTION REQUIREMENTS

Regulations calling for mandatory connection to public water supplies, where public water service is, or could be made available, are recommended for allowing better system planning and financing.

EXTENSION OF SERVICES

The community should have a definite policy for determining the method by which service extensions are made. Where water is provided by a private utility firm, extensions are largely dictated by economic factors. Where the system is publicly operated, there should be clear-cut processes by which the service can be extended without undue "red tape."

Where vacant areas must be crossed, or where the pipe network calls for oversized lines, a policy should be firmly established describing any special financial arrangements for such cases.

WATER QUALITY

The treated water should meet State and Public Health Service quality standards. A recommended minimum standard suitable for States and local areas is given in *Public Health Service Drinking Water Standards.*

WATER QUANTITY

Capacity and storage should be such as to provide quantities adequate for maximum day demands, without significant loss of pressure. The system should also be capable of meeting fire-flow demands. In most cities under 200,000 population, the water required for fire fighting purposes, plus the maximum day consumption, is the governing factor in design. Requirements for fire fighting needs are usually based on standards set by the National Board of Fire Underwriters.

RATE STRUCTURE

Although no empirical figure can be provided as a "reasonable" water rate, the cost of water should be fairly consistent throughout the study area and should be reasonable enough to encourage connection to the public supply. In some communities, water revenues are too low to allow sound fiscal planning for depreciation or anticipated expansion needs. In other areas, water rates are set high enough to give a surplus sometimes used for other purposes. A thorough study of the rate structure is desirable to avoid both of the above practices and to provide fiscally sound service rates.

The average monthly residential bill is a convenient means of comparing costs with those in other areas. For comparative purposes, an assumed quantity of 1,000 cubic feet per family per month is suggested (about 75 gallons per capita per day*).

Example:

Charges—first 900 cu. ft. or less per quarter
0.45/100 cu. ft.

Next: 1,200 cu. ft./quarter
0.36/100 cu. ft.

Next: 9,900 cu. ft./quarter
0.30/100 cu. ft.

Cost: 900 @ 0.45/100 = $4.05
1,200 @ 0.36/100 = 4.32
900 @ 0.30/100 = 2.70
$11.07

for 3,000 cu. ft. in 3 months or
$3.69 for 1,000 cu. ft. per month.

AREAS SERVED

Public water supply service should be provided to those areas where service can be justified from health and economic standpoints. In making the following evaluation, the water service map should be compared with present and also future population density maps. The percentage of homes served in each population density group can then be determined.

This chart is based on average cost of public vs. private water supplies as compiled from various journals and reports. The policies of State public utility commissions regarding capital investment-financial return were also taken into account.

Local characteristics may indicate an adjustment to these criteria is needed in some cases, but they are suitable for average conditions as a "rule-of-thumb" guide in determining economic justification of public water service.

Population Density	*Equivalent Lot Size*	*Service Economic Justification*
Over 2,500 persons/sq. mi.	Less than 1 acre	Public water supply is justified
1,000-2,500 persons/sq. mi.	1 to 2 acres	Public water supply is normally justified.
500-1,000 persons/sq. mi.	2 to 4 acres	Public water supply is not normally justified.
Less than 500 persons/sq. mi.	Over 4 acres	Public water supply is rarely justified.

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* This is an average figure for the eastern United States, 1963-65. For the west, during the same time period, average gpcd was about ⅔ higher. (Reference HUD TS-12, February 1967).

REFERENCES:

1. *Public Health Service Drinking Water Standards,* 1962. PHS Pub. No. 956.
2. *Water Supply and Plumbing Cross-Connections,* 1963. PHS Pub. No. 957.
3. *Manual of Individual Water Supply Systems,* 1963. PHS Pub. No. 24.
4. *Manual of Recommended Practice for Public Drinking Water Supply Evaluation,* (in preparation 1967).
5. *Report of PHS Technical Committee on Plumbing Standards,* 1962. PHS Pub. No. 1038.
6. *Manual for Evaluation of Water Bacteriological Laboratories,* 1966. PHS Pub. No. 999.

G. RADIOLOGICAL HEALTH

This section is designed to assist in determining the need for radiological health activity in the community by bringing some factors to the attention of the study group.

RADIOLOGICAL HEALTH — DATA FORM

1. Is there any local program with regard to radiation effects on public health? .... If so, what agency has this responsibility? ....
2. Is there a State level program for radiological health? ....
3. Are State and local regulatory codes adequate to safeguard health? ....
4. Have all radiation sources been located and surveyed? .... If so, has the community been conditioned to understand these developments through public information? ....
5. Are new radiation sources contemplated? .... If so, has the community been conditioned to understand these developments through public information? ....
6. Is there an environmental monitoring program? .... Is surveillance work conducted? .... Are there adequate radioactive waste disposal criteria? ....
7. What departments of the government are affected? ....
   Are all personnel trained? .... By whom? ....
8. Is there an emergency accident plan? .... Warning Systems? ....
   Special transportation routes designated? ....
9. Has the master plan for community development been updated to include nuclear industry needs? ....

RADIOLOGICAL HEALTH — EVALUATION GUIDES

PUBLIC HEALTH POLICY

Ionizing radiation, if properly utilized, is instrumental in improving the health and welfare of the people. Exposure to radiation, however, results in damage which may not be apparent immediately. Therefore, consistent with good medical practice, exposure to radiation from all controllable sources must be minimized. Governmental health departments should be given the legal authority to guard the public against undue exposure. Control of sources of ionizing radiation for the protection of the public against the hazards of radiation exposure is a government function for which official health departments should be given major legal responsibility. It is urgent that Federal, State, and local governments establish health department programs to identify and evaluate human exposures and the radiation sources responsible for them and to develop effective control measures where necessary. The basic public health objectives are to recognize the essential uses of radiation and to reduce, wherever possible, exposures incident to them as well as to preclude unnecessary radiation exposures.

LEGISLATION

Most states now have adopted legislation regarding radiation sources, in the form of registration requirements, comprehensive radiation protection codes, coordinating mechanisms, or advisory groups on atomic energy development. A suggested State Radiation Control Act has been developed for possible adoption.

RADIATION SOURCES

X-RAY

The increasing number of medical, dental, industrial, and research uses of X-ray equipment makes it desirable that standards for health protection be adopted and enforced. Medical and dental uses include diagnostic and therapy units with radiation exposure. Industrial uses include units designed for the determination of defects in castings and welds and for the detection of foreign bodies in packaged foods. Shoe-fitting fluoroscopes may cause unnecessary radiation exposure both to the public and to the operators and the use of this type of radiation device is restricted or banned in many states and local areas.

RADIONUCLIDES

The naturally occurring radionuclide most widely used in medicine and industry is Ra^{226}. An important factor to remember when considering the health aspects of naturally occurring radionuclides is that they can be purchased on the open market without formal application or special facilities being required. Industrial uses include radiography, luminous compounds and static eliminators such as are sometimes used by textile and paper trades, printing, photographic processing, and telephone and telegraph companies.

Artificially produced radionuclides are produced by the Atomic Energy Commission. In addition to industrial and research uses, an increasing number of physicians is licensed by the Atomic Energy Commission to utilize radionuclides for diagnosis or treatment of illnesses. The preparation, handling and transportation of these radionuclides involve possible exposures, as does the disposal of wastes originating from these materials.

NUCLEAR REACTOR OPERATIONS

Sources of radiation exposure associated with nuclear reactor operations include the reactor itself, its ventilation and cooling wastes, and the fission product wastes. Most major colleges and universities now have reactors and some utility company reactors are coming into use.

SURVEILLANCE

The presence of radiocontaminants in the environment may range from one radionuclide in one environmental phase to multiple contaminants in multiple environmental phases.

Evaluation of the overall health significance of such contaminants requires an understanding of the concept of Radioactivity Concentration Guides or "Maximum Permissible Concentrations," and the additive effects of multiple radiation sources.

If the air and water in a particular area contain radioactive materials, it is quite probable that significant contamination will be present in milk and foodstuffs produced in that environment. Because public health officials must be in a position to evaluate the total radiation stress being placed upon man, and to do so they must know all sources of radiation exposure, measurements restricted to any one environmental phase will not be adequate. In fact, such a monitoring procedure could lead to a false sense of security, since the "obvious" hazard is not always the "real" hazard. An effective routine monitoring program is desirable as one part of community radiological health activities.

Should monitoring show local levels to be rising, or at a potential danger point, countermeasures may need to be applied. These may affect the source, the vectors (air, water, milk, food) or the host (population). Before countermeasures can be applied intelligently, the exact sources contributing to the high levels, the geographic area, and the population groups adversely affected must all be identified. This requires a monitoring and laboratory competency far greater than is needed for "routine" surveillance.

TRAINING

Training in the sanitary engineering aspects of nuclear energy is offered by the Public Health Service, along with specialized courses on nuclear energy. Numerous colleges and universities are currently offering seminars and short courses, as are some industrial groups, and also the Atomic Energy Commission. Training films for loan are available both from the Atomic Energy Commission and the Public Health Service.

H. RECREATIONAL SANITATION

RECREATIONAL SANITATION — DATA FORM

A. The Study Area

1. Inventory of Recreation Areas

Name	*Location*	*Size (Acres)*	*Recreation Uses*

2. List Special Areas:	*Number Recommended**	*Number Available*
18-hole golf courses	(one/50,000 pop.)	....
Baseball diamonds	(one/ 6,000 ")	....
Softball diamonds	(one/ 3,000 ")	....
Tennis courts	(one/ 2,000 ")	....
Swimming pools	15 sq. ft. per person for 3% of the pop.	....

3. Is there a need for additional recreation areas within and beyond municipal limits? .... If so, indicate on the study map (See Question 16) the location of potential sites.

4. List the agencies that have authority or other direct interest in the areas. ....

5. Has a "Master Plan" been prepared for future recreation needs? .... If so, is it being followed? ....

6. Is Federal financial assistance being obtained for the development of recreation areas? .... Describe. ....

7. Are sanitary surveys conducted periodically to evaluate environmental health planning aspects? .... Describe. ....

B. Environmental Health Planning Aspects

1. Site Selection
   a. Has proper consideration been given to sites in regard to drainage, soil permeability, topographical or geological hindrances, accessibility of sources of water supply or sewage works and possible effects of swamps, streams or lakes? .... Describe. ....

....

....

....

2. Watershed Sanitation
   a. Have water pollution control regulations been enacted and are they enforced? ....
   b. Inventory of pesticide control activities.

*National Recreation and Parks Association

Area	*Insect*	*Control Objective*	*Acres*	*Insecticide Dosage, Methods & Precautions*

c. What rules and regulations have been enacted regarding recreational use of watersheds? ....
.... Are they adequate? ....

d. Are adequate facilities provided for fish-cleaning and disposal of wastes? ....

3. Water Supply
   a. Briefly describe the systems serving the area. ....
   ....
   b. Do present supplies comply with the *PHS Drinking Water Standards* or equivalent? ....
   c. Are there additional approved sources of water supply available? ....
   d. Are plans and specifications for the construction of new water supply systems reviewed for approval action by the health authority? ....
   e. Has a "Master Plan" been prepared for the future water needs of the recreation areas? .... Describe.
   ....

4. Plumbing
   a. Are plumbing fixtures installed in accordance with an adequate Plumbing Code? .... Is it enforced? ....
   b. Are plumbing systems surveyed routinely for cross-connections or other health hazards? .... Describe.
   ....

5. Sewage Disposal
   a. Describe the types of systems available. ....
   ....
   b. Are plans and specifications for the construction of new sewage disposal systems reviewed for approval action by the health authority? ....
   c. Has a "Master Plan" been developed for sewage disposal needs in recreation areas? .... Describe.
   ....

6. Refuse Disposal
   a. Briefly describe procedures used for collection, storage, and disposal of refuse.
   ....
   Are they adequate? ....
   b. Describe any hazards or nuisances observed in relation to camp and park sanitation. ....
   ....
   c. Show on the study map (See Question 16) the location of the refuse disposal site(s).

7. Swimming Pools
   a. Have rules and regulations regarding the construction and operation of swimming pools been enacted?
   .... Are they adequate? ....
   b. Are bathhouses adequate? ....

8. Outdoor Bathing Areas
   a. List the potential pollution sources. ....
   b. Are minimum water quality standards adequate? .... Is bathing allowed in areas not meeting these standards? ....
   c. Are bathhouses adequate? ....
   d. Have safety measures been enacted and enforced? ....

e. Is the operation of pleasure boats restricted near waterworks, intakes, bathing areas, and dams? ....
If so, what distances are used and how are restricted areas identified? ....
....

9. Insect and Rodent Control
   a. Are recreational sites cleared routinely to prevent insect infestation? ....
   b. Are any insecticides or rodenticides used? .... If so, do the handlers have a thorough knowledge of the proper dosage and potential harmful effects?..

10. Boating
   a. Magnitude of problem
      (1) Approximate acreage usable for pleasure boating. ....
      (2) Are specific areas designated for boat launching? ....
      (3) Is boating on a seasonal or year-round basis? ....
      (4) List improvements which might increase recreational boating within study area. ....
      ....
   b. Have marina or other facilities been constructed for boating purposes? .... If so, do they include adequate facilities for collection of domestic sewage, ... waste fuels, ... and refuse? ....
   c. Have regulations been enacted on disposal of boat wastes into the watercourses? .... If so, are they enforced? ....
   d. Safety regulations: What do they cover and are they enforced adequately? ....
   ....

11. Building and Housing Hygiene
   a. Have rules and regulations been enacted for the construction of buildings and dwelling units in the areas? .... Are they adequate? ....
   b. Is a continued evaluation program conducted to control deterioration and rehabilitation? .... Describe ....

12. Food Sanitation
   a. Have adequate food service rules and regulations been enacted relating to the construction and operation of food service facilities in recreation areas? .... Describe. ....
   ....
   b. How often are food service establishments inspected? ....

13. Recreation Vehicle Parking Areas
   a. Have rules and regulations been enacted for the construction and operation of travel-trailer and other recreation vehicle parking areas? ....
   b. Are recreation vehicle parking areas provided with adequate:
      (1) parking spaces ....
      (2) service buildings ....
      (3) individual electrical, water and sewer hookups ....
      (4) sanitary stations ....

14. Campgrounds and Picnic Areas
   a. Are comfort stations adequately provided to serve campgrounds and picnic areas? .... Describe.
   ....
   b. Are outdoor fireplaces properly located to minimize fire control problems? ....

15. Stable Sanitation
   a. Are stables properly constructed and corrals sloped to facilitate proper drainage? ....
   b. Is manure collected, stored, and disposed of properly? .... Describe. ....
   ....

16. Maps
   a. Show the location of all campgrounds, picnic areas, boating facilities, and other recreational facilities.

RECREATIONAL SANITATION — SUMMARY CHART

Recreation Area	Operated by	Master Plan	Capital Improvements Program	Capital Budget	PROGRAM INCLUDES (Enter check; otherwise enter dash)																
					watershed sanitation	water supply	plumbing	sewage disposal	refuse disposal	swimming pools	outdoor bathing places	insect & rodent control	boating	building & housing hygiene	food sanitation	recreational vehicle parking	campgrounds & picnic area	stable sanitation			

RECREATIONAL SANITATION — EVALUATION GUIDES

INTRODUCTION

The conservation, development, and wise use of outdoor recreational resources are of great importance in satisfying the social and health goals of our population. Expanding leisure time, growing interest in outdoor recreation, increased urbanization and mobility of people, and a rising standard of living make it possible for more people to seek and utilize recreation areas.

The term "recreation area," in this discussion, refers to land and water areas dedicated to the enjoyment of the public. Such areas generally involve facilities operated by a public agency, concessions, or voluntary or private groups or individuals and include parks, campgrounds, shelters, picnic areas, travel-trailer parking areas, resorts, motels, hotels, cabin camps, organizational camps, marinas, and other facilities relating to hiking, picnicking, camping, touring, and sightseeing.

In recognition of the need for increased attention to satisfying the needs for recreation by our citizens, the Congress authorized under Public Law 85-470 in 1958, the creation of an Outdoor Recreation Resources Review Commission to study and make recommendations for future provision of recreation opportunities.

MAJOR FINDINGS OF ORRRC STUDY

Some findings of the study contained in *Outdoor Recreation For America, A Report to the President and to the Congress by the Outdoor Recreation Resources Review Commission,*[1] January 1962, are outlined below. This report and 27 auxiliary study reports recommend the future direction and requirements for outdoor recreation in the United States.

The Simple Activities are the Most Popular — Driving and walking for pleasure, swimming, and picnicking lead the list of the outdoor activities in which Americans participate, and driving for pleasure is most popular of all.

Outdoor Opportunities are Most Urgently Needed Near Metropolitan Areas — Three-quarters of the people will live in these areas by the turn of the century. They will have the greatest need for outdoor recreation, and their need will be the most difficult to satisfy, as urban centers have the fewest facilities (per capita) and the sharpest competition for land use.

Across the Country, Considerable Land Is Now Available for Outdoor Recreation, But it Does Not Effectively Meet the Need — Over a quarter billion acres are public-designated outdoor recreation areas. However, either the location of the land, or restrictive management policies, or both, greatly reduce the effectiveness of the land for recreation use by the bulk of the population. Much of the West and virtually all of Alaska are of little use to most Americans looking for a place in the sun for their families on a weekend, when the demand is overwhelming. At regional and state levels, most of the land is where people are not. Few places are near enough to metropolitan centers for a Sunday outing. The problem is not one of total acres but of effective acres.

Money Is Needed — Most public agencies, particularly in the states, are faced with a lack of funds. Outdoor recreation opportunities can be created by acquiring new areas or by more intensive development of existing resources, but either course requires money. Federal, state, and local governments are now spending about $1 billion annually for outdoor recreation. More will be needed to meet the demand.

Outdoor Recreation Is Often Compatible With Other Resource Uses — Fortunately, recreation need not be the exclusive use of an area, particularly the larger ones. Recreation can be another use in a development primarily managed for a different purpose, and it therefore should be considered in many kinds of planning — urban renewal, highway construction, water resource development, forest and range management, to name only a few.

Water Is a Focal Point of Outdoor Recreation— Most people seeking outdoor recreation want water — to sit by, to swim and to fish in, to ski across, to dive under, and to run their boats over.

Swimming is now one of the most popular outdoor activities and is likely to be the most popular of all by the turn of the century. Boating and fishing are among the top 10 activities. Camping, picnicking and hiking, also high on the list, are more attractive near water sites.

Outdoor Recreation Brings About Economic Benefits — Although the chief reason for providing outdoor recreation is the broad social and individual benefits it produces, it also brings about desirable economic effects. Its provision enhances community values by creating a better place to live and increasing land values. In some under-developed areas, it can be a mainstay of the local economy. Finally, it is a basis for big business as the millions and millions of people seeking the outdoors generate an estimated $20 billion a year market for goods and services.

Outdoor Recreation Is a Major Leisure Time Activity, and It is Growing in Importance — About 90 percent of all Americans participated in some form of outdoor recreation in the summer of 1960. In total, they participated in one activity or another on 4.4 billion separate occasions. It is anticipated that by 1976 the total will be 6.9 billion, and by the year 2000 it will be 12.4 billion — a threefold increase by the turn of the century.

More Needs to be Known About the Values of Outdoor Recreation — As outdoor recreation increases in importance, it will need more land, but much of this land can be used, and will be demanded, for other purposes. Yet there is little research to provide basic information on its relative importance. More needs to be established factually about the values of outdoor recreation to our society, so that sounder decisions on allocation of resources for it can be made. More must be known also about management techniques, so that the maximum social and economic benefit can be realized from these resources.

ENVIRONMENTAL HEALTH PLANNING ASPECTS

From the standpoint of environmental health, the planning, provision, and maintenance of facilities in recreational areas have not, in many instances, kept pace with the rapidly increasing visitor load to various types of recreation areas. As a result, optimum use of such areas is not always possible and deterioration of overtaxed facilities is frequently encountered. Where facilities such as water supply, sewage disposal, and refuse handling are inadequate or totally lacking, the visitors will fend for themselves, often creating conditions which are grossly insanitary as well as creating serious environmental health hazards for themselves and neighboring community residents. Unless corrective action is taken, this condition will be further aggravated, since within the next 40 years the population of the United States is expected to double, while demands for outdoor recreation are expected at least to triple. Estimates are that adequate environmental health utilities and health-related safeguards often may approximate one-third of development costs for new recreation areas. Investment in adequate and efficient facilities to provide proper environmental conditions is an important aspect of recreation area development.

It is important to note that in the overall Federal recreation policy being developed by the Bureau of Outdoor Recreation, Department of Interior, there is full recognition of the need for high standards of public health in recreation. Emphasis is placed on the need for the cooperative participation of all levels of government and private enterprise for the planning, provision and maintenance of sanitary facilities in the recreation environment. This has been stated in the Recreation Advisory Council's Circular No. 3, *Policy Governing The Water Pollution and Public Health Aspects of Outdoor Recreation*[2]. Excerpts include the following:

> . . . it is incumbent upon agencies responsible for the planning, development, and operation of outdoor recreation areas to provide the health and sanitation safeguards required to protect the health, safety, and well-being of the recreation users. . . .

To achieve that objective, agencies responsible for the management of outdoor recreation areas shall utilize the recommended health standards of the Federal, state, or local public health authority having jurisdiction; and they shall maintain close cooperation and consultation with the appropriate public health authority.

There are many important considerations which must be included in the overall planning, development, and operation of recreation areas to insure that proper health protection of individuals visiting or residing in or near such areas will be provided and maintained.

Recreation Environment

Among the requisites for a safe and healthful recreation environment are the following:[3]

1. Site selection — includes proper consideration of drainage, soil permeability, topographical or geological hindrances, accessibility to proposed sources of water supply or sewage works, mosquito and disease vectors, location and possible effects of swamps, streams and lakes on health and safety.
2. Watershed management — the supervision, regulation, maintenance, and wise use of the aggregate resources of a drainage basin to provide the maximum yield of desirable quality, including the control of erosion, pollution, and floods. The principal activities include: construction, logging, grazing, mining waste disposal, pesticide control, conservation, fire control, and recreational use of watersheds.
3. Water supply — development of sources, treatment and distribution of water supply for domestic and culinary purposes that meets physical, chemical, and bacteriological requirements of the *Public Health Service Drinking Water Standards* or equivalent.
4. Sewage disposal — proper sewage collection, treatment, and disposal facilities to prevent defilement of land and water areas, and to prevent pollution of surface or underground waters or other conditions conducive to the transmission of communicable diseases and to enable maximum enjoyment of water areas.
5. Plumbing — adequate fixtures, approved materials, and proper installation and maintenance procedures to prevent cross-connection and backflow conditions in plumbing systems. Utilization of permanent and mobile comfort stations and portable toilets.
6. Building and housing hygiene — adequate and safe housing, including campsites, cabins, dormitories and other public use buildings.
7. Food service sanitation — design of kitchen, dining and other facilities to insure that safe handling and serving of food and drink to the public can be accomplished. Certification of sources of foods, frozen desserts, and milk and milk products during operation.
8. Refuse handling — proper storage, collection, and disposal of garbage and other refuse.
9. Swimming pools and outdoor bathing places — design and operation of swimming pools. Evaluation of water quality and bacteriological standards for outdoor bathing places.
10. Travel-trailer parking — development of adequate travel-trailer parking areas to provide parking accommodations, service building facilities, water and sewage hookups and other liquid waste disposal facilities, including a sanitary station for sewage disposal from holding tanks.
11. Boating — design of marinas to provide adequate facilities for launching, docking, collection and disposal of domestic sewage, waste oils and fuels, and solid wastes such as garbage and refuse. Requirements for operation of boats equipped with marine toilets.
12. Fish-cleaning facilities — provision of adequate facilities to control nuisances, odor, and pollution from cleaning fish and disposal of waste products.
13. Insect and rodent control — provision of adequate prevention and control measures during the planning, construction, and operational phases of recreation areas to minimize public health hazards created by insects and rodents.

14. Recreation safety — elimination of accident hazards and promotion of safety.
15. Campgrounds and picnic areas — development of campgrounds and picnic areas for the enjoyment of the recreationist with proper consideration given for environmental health factors relating to this mode of recreation.
16. Stable sanitation — provision of adequate facilities for stabling of horses and proper removal, storage, and disposal of manure.

The most effective means to insure consideration of these environmental health planning aspects and assessment of their present and future significance is by active cooperation between health and recreation agencies. The development and review of plans of proposed developments and facilities with full assistance by qualified public health engineers and sanitarians is recommended as the priority activity. A program should be established to conduct periodic sanitary surveys in recreation areas, including the detailed inspection of facilities and their operation and maintenance.

Sanitation Problems Peculiar to Recreation Areas

There are unusual conditions of location and use encountered in many recreation areas which often make it difficult to apply solutions or procedures found satisfactory in the average city or community to provide adequate public health protection. These conditions may include:

1. Seasonal operation — The operation of recreation areas, such as camp or lake resorts on a seasonal basis creates many economic problems. Adequate public health precautions require use of devices and equipment such as chlorinators, dishwashing machines, and sewage treatment facilities which are often expensive equipment if they will be used only three or four months of the year. Seasonal operation also creates many problems related to personnel and staffing. Experienced personnel to operate modern-type water and sewage treatment facilities or work in food service establishments are often difficult to hire for short operating seasons. Consequently, most personnel must be trained and by the time this is accomplished, it is time to close the area for the winter.
2. Public behavior — A serious difficulty in public use of many recreation areas is irresponsibility of some visitors. Complaints are common about vandalism, theft, and thoughtless actions injurious to property and to the general recreation environment. Comfort stations and plumbing fixtures are special targets of vandalism. Picking up trash and litter left by some guests, and repairing petty damages are often a major expense. Careless disposal of garbage is a major contributing factor to fly production and nuisance in recreation areas. The solution of this problem of public behavior may require major expenditures for additional enforcement or caretaking personnel and an extensive public education program.
3. Vector and animal problems — Recreation in the outdoors provides the recreationist with much more exposure to animals, reptiles, and insects which, in many instances, may pose a threat to health and safety. Infection by encounters with rabid bats, ticks causing Rocky Mountain spotted fever, encephalitis, and fleas from rodents infected with plague is potential in many areas. Insects crawling into the ears of outdoorsmen have created painful conditions that require surgical procedures for removal. Visitors are sometimes bitten or attacked by animals such as bears or snakes. Mosquito bites may cause such discomfort to visitors that some recreation areas are unused or full enjoyment is not possible.

Animals also cause other indirect health problems such as those caused by the activities of bears and wild animals with the contents of refuse containers. Bears are often observed foraging for food in refuse containers, which results in the containers being turned over and refuse scattered about. This increases collection costs and the litter which is not promptly picked up contributes to fly breeding.

4. Noxious plants and weeds — Contact with these are increasing as greater numbers of people are exposed to the outdoor environment. Millions of Americans suffer from hay fever and other allergic reactions such as poison ivy and poison oak. Fortunately, weed control measures may be instituted to provide relief in areas of serious infestation.
5. Remote locations — Lack of electric power and roads in remote areas causes many design and operation problems. If electric power is unavailable, pressure for a water distribution system must be provided by other means. Intakes may be located high enough upstream to produce sufficient pressure by gravity flow or internal combustion engines may be used for pumping. Transportation of construction materials and operational supplies to a remote water intake or treatment location may be difficult.
6. Landscape and wildlife protection — The objectives of many recreational activities require, among other things, the preservation and development of the natural scene for enjoyment by present and future generations. This entails considerable effort on the part of planners to assure that the natural scene will not be despoiled by manmade structures such as elevated steel water tanks, water and sewage treatment facilities, and refuse disposal facilities located within view of visitors. This factor of landscape protection requires many sanitary engineering innovations and often results in the use of alternative methods which are most costly.

RECREATION SPACE CRITERIA AND STANDARDS

According to the National Recreation and Park Association, the nationally recognized and generally accepted standard for recreation space located within municipal limits, is 10 acres per 1000 of the ultimate population as outlined below:[4]

Near-at-Hand	*Acres/1000 Ultimate Population*
Neighborhood Recreation Areas	2.5
District Recreation Parks	2.5
Within an Hour's Travel	
Large Urban Parks, Reservations, Golf Courses, and other Regional Areas within municipal limits	5.0
Total	10.0

This is only part of the recreation areas that an urban population needs or that local governments should provide. Planning for and providing the recreation lands needed by our rapidly expanding urban population cannot be done on a municipal basis alone. It must be done on a county, metropolitan or regional basis, just as planning for area-wide transportation, water supply, sewage disposal, and other needs is accomplished. We need to think of a *Recreation Environment* in future planning of our metropolitan areas. Our people are becoming more mobile every day and the urban dweller requires not only the local recreation areas and facilities, but the large parks and reservations which can be reached within an hour of driving. Beyond these should be the great areas which require several hours or even days to reach and are provided by the State and Federal governments.

Standards beyond the 10 acres per 1000 of the municipal population have never been definitely set forth and nationally accepted, but there are indications of what they should be. Based on current experience and trends, there appears to be some agreement that there should be at least 15 acres of regional recreation area per 1000 of the metropolitan population, located within an hour's travel of the municipality.

RESEARCH

The need for greatly increased research activities in recreation sanitation was stressed by the Gross Committee[5] and is reflected by the many requests for assistance arising from environmental health problems being experienced by the Public Health Service, state and local health departments, and other agencies in the field of recreation. Major problems relate to:

A. Adequate design criteria to plan recreation areas more effectively for the purpose of preventing public health problems — lake capacity for boats, limits of housing and subdivision developments around lakes and water-courses relating to water supply, sewage disposal and pollution problems.

B. Adequate control measures for disposal of sewage and wastes from pleasure boats, houseboats, and homes on or along lakes and bodies of water used for fishing, swimming, water sports, and sources of domestic water. Guidelines on recreational use of multi-purpose and domestic water supply reservoirs.

C. Design criteria for water supply, sewage treatment, refuse-handling practice, and other sanitary facilities for various types of recreational facilities as camps, parks, mobile-home parks, travel-trailer parks, picnic areas, and roadside stops.

It is hoped that greater attention to the research needs in this field will develop as the recreation impact grows. New and improved solutions to the environmental health problems must be found if maximum utilization and enjoyment of recreation areas are to be obtained in the future.

SUMMARY

Considerable attention is being focused on the outdoor recreation resources of this country by all levels of government, public and private agencies, concessionaires, and the recreationist. Our recreation environment is becoming greatly overcrowded, many existing areas lack adequate health and sanitary facilities, and the development of new areas requires investment of money, resources, and effort.

There are many environmental health planning aspects which must be considered in the over-all planning, development, and operation of existing and future recreation areas to provide the health and sanitary safeguards to protect the health, safety and well-being of the recreation users. We all have a necessary and significant role in this endeavor.

The need for greater participation and cooperation between health, planning, and recreation agencies to determine recreation trends and provide adequate recreation opportunities and facilities is one of the most challenging of the metropolitan planning jobs to be done.

REFERENCES:

1. Outdoor Recreation Resources Commission. *Outdoor Recreation for America: A Report to the President and to the Congress.* 1962. 245 pp.
2. Recreation Advisory Council Circular No. 3. *Policy Governing the Water Pollution and Public Health Aspects of Outdoor Recreation.* 1964.
3. *Environmental Health Practice in Recreation Areas.* DHEW, PHS. Pub. No. 1195. 1965.
4. *Outdoor Recreation Space Standards.* National Recreation and Park Association, West 8th St., New York, N.Y. 1965
5. *Report of the Committee on Environmental Health Problems to the Surgeon General.* U. S. Department of Health, Education, and Welfare, Public Health Service. 1962.

I. RESIDENTIAL ENVIRONMENT: HOUSING AND NEIGHBORHOODS

This section is to determine the efficiency of housing services and programs within the study area.

Agency ....

RESIDENTIAL ENVIRONMENT: HOUSING AND NEIGHBORHOODS — DATA FORM

1. Have the following regulations been enacted?

Regulation or Code	*Yes(√) or No(X)*	*Agency Responsible*	*Area of Jurisdiction (Show on map— see p. 98 for example)*
Housing Maintenance and Occupancy*			
Building			
Plumbing & Heating			
Electrical			
Zoning			
Subdivision			
Rooming House			
Multiple Dwelling			
Mobile Home Park			
Demolition of Unsafe Structures			
Refuse			
Fire Prevention			

2. Which of the following services or programs are provided?
    a. Housing Maintenance and Occupancy Code Enforcement?
        (1) On complaints only ....
        (2) On a planned basis ....
            (a) By systematic enforcement in selected areas ....
            (b) By periodic inspection related to permits and licenses ....
        (3) On a complaint basis and periodic basis ....
        (4) On all 3 bases ....
    b. Systematic evaluation of housing and neighborhood quality? ....
        What evaluation or appraisal method is used? ....
    c. Community organization or planned education program for housing and neighborhood improvement?
        ....
        By which agency, committee, or group? ....

---

* Means housing code similar to *APHA-PHS Model Housing Maintenance and Occupancy Ordinance* and does not include enforcement of sanitary code or other general regulations in residential areas.

d. Coordination of housing and neighborhood improvement programs?

How?

e. Review of plans for conversions (creation of new dwelling units within existing dwellings)?

By which agency?

f. Home accident prevention program?

By which agency?

g. Other special services or programs for control of housing quality?

3. Residential Environment: Housing and Neighborhood Quality.* Show location of sub-standard areas on map. (See page 98 for example.)

a. Number of residential structures?

b. Number of dwelling units?

c. Number of substandard dwelling units?

d. Approximate number of new dwelling units constructed per year?

e. Number and location of public and private indoor and outdoor common spaces in the neighborhood. (A neighborhood usually can be described as an area requiring not more than 20 minutes to walk across, bounded by major traffic arteries, railroads, major parks or playgrounds or shopping centers. The purpose of this item is to reveal relatively deficient neighborhoods; it applies only to those parts of the residential environment where existing land-use results in an average lot size of less than ½ acre per family.)

4. Neighborhood Code Enforcement Project(s)

Name and Type of Project(s)	*Size*	
(Predominantly conservation, rehabilitation)	*Acres*	*No. of Dwelling Units*

---

* If not available otherwise, information on the number of dwelling units and "dilapidated" dwelling units may be obtained from Bureau of the Census publications: *Census of Housing-Nonfarm Housing Characteristics,* and *Census of Housing-General Characteristics.*

5. Urban Renewal Project(s)

Name and Type of Project(s)	*Size*	
(Predominantly clearance, rehabilitation)	*Acres*	*No. of Dwelling Units*

6. Is there a public housing authority? .... If so, how many housing units are provided? ....

What is the current estimate of additional public housing units needed? ....

RESIDENTIAL ENVIRONMENT: HOUSING AND NEIGHBORHOODS — EVALUATION GUIDES

The housing guides are not designed to evaluate the quality of housing in the area. The guides will assist in revealing any major gaps in the mechanism designed to control housing conditions. Precise measures of quality require detailed study using the APHA Housing Quality Appraisal Technique.

REGULATIONS

The only way to prevent slums is to insure that all of the study area has a comprehensive set of regulations and programs for the control of both new and existing dwellings. Anything less than complete coverage leaves a loop-hole for the development of slums either in the core city, the suburbs, or on what may now be open land.

There is no ideal structure for a comprehensive residential environment program, and it usually evolves from experience. Housing, building, plumbing and heating, electrical, neighborhood common space, zoning and subdivision codes or regulations are all considered essential. Rooming house, mobile-home park, travel-trailer park, multiple dwelling and nursing home regulations are not essential unless the background data indicate a sizable number in, or proposed for, the area.

HOUSING PROGRAMS

Housing programs should utilize a systematic evaluation of housing and neighborhood quality. The APHA Housing Quality Appraisal Technique is perhaps the most widely accepted method, but locally developed methods have been used. The main criterion is that some objective technique be employed on a systematic basis. This will serve to identify the location and nature of deterioration and permit the charting of a quality rating for a neighborhood. Where housing and neighborhood evaluation studies have been conducted, the location on a map of sub-standard dwelling units and neighborhoods deficient in common space is a useful part of the report. Preventive or remedial action can then be taken at the right time.

Good housing in a good neighborhood is not enough for achieving environmental conservation or permanent slum prevention. Programs should be developed to create neighborhood organizations, such as Homes Associations, dedicated to improvement of housing maintenance and occupancy conditions, and these should be fostered and coordinated by some officially designated agency or committee.

A strong program of prevention requires review of all plans for housing conversions or alterations.

In housing rehabilitation there are many opportunities for home accident prevention. This must depend more upon education and technical advice than upon code specifications.

RESIDENTIAL ENVIRONMENT: HOUSING AND NEIGHBORHOODS — SUMMARY CHART

AGENCY NAME	PROGRAM INCLUDES (Enter check for yes; enter dash for no)													DWELLING UNITS			NEIGHBORHOODS		
	Housing Maintenance & Occu. Code Enfcmt.	Accident Prevention	Urban Renewal	Conversion Plan Review	Public Housing	Building Code	Plumbing, Heating Codes	Electrical Code	Zoning	Subdivision Review	Multiple Dwelling License	Rooming House License	Mobile Home Park License	Total No.	Est. No. substandard	Constr. annually	Total No.	No. of Minor Leisure Time Cmn. Spaces	No. of Mjr. Pk. & Rec. Areas
	Complaint Periodic Pl. Area Pl.																		

CONSTRUCTION PROJECTS

Many communities are finding that urban renewal projects are worthwhile for certain deteriorated areas. Before entering upon an urban renewal program, evaluation of housing conditions is needed.

Certain groups within the community may require low-cost housing. Where adequate housing facilities for these groups are not otherwise available, public housing may be needed.

Some recommendations usually lend themselves to estimates of timing or preliminary cost figures and these may either be included in the basic report or left for later supplementary reports, particularly if lengthy analysis or outside consultant service is needed.

REFERENCES:

1. USDHEW, PHS, Office of Urban Environmental Health Planning, *Health Department Subdivision Plat Approval in Planned Residential Developments with Homes Associations,* May 1965. Urban Environmental Health Planning Advisory No. 1. 4 pp.
2. USDHEW, PHS, Office of Urban Environmental Health Planning, *Federal Aid for Health Department Housing Code Enforcement,* Feb. 28, 1966. 4 pp.
3. National Association of Housing and Redevelopment Officials, *Orientation Workshops on Environmental Health and Related Housing Code Administration,* April 1966. NAHRO Pub. No. N 492, 77 pp.
4. USDHEW, PHS, CPEHS, ECA, *Health Agency Responsibility for Achieving Minimum Health Standards in Existing Housing,* Preliminary edition, third printing, Dec. 5, 1966. 34 pp.
5. USDHEW, PHS, CPEHS, ECA, *Legal Aspects of Housing Code Enforcement,* By David A. Polatsek, Office of the General Counsel, DHEW. April 7, 1967. 27 pp.
6. Subcommittee on Housing Regulations and Standards, Program Area Committee on Housing and Health, American Public Health Association, *APHA-PHS Recommended Housing Maintenance and Occupancy Ordinance,* First action copy. Nov. 1, 1967. 63 pp.

J. SANITATION SERVICES

No attempt is made to "rate" the services in this category, but a variety of sanitation programs is listed primarily to point out any programs which may be duplicated or those which may be lacking in the community.

It is not suggested that every community should necessarily conduct all the programs listed, but their value should be considered in connection with a study of environmental health. Where the community wishes to evaluate the effectiveness of specific programs, special rating methods are available. Examples of these are the Public Health Service compliance rating schedules for milk control programs and for eating and drinking establishments and compliance check lists for major park and recreation area sanitation.

The American Public Health Association also has prepared evaluation methods for many facets of sanitation and organization of public health operations, the *Evaluation Schedule* and also the *Guide to a Community Health Study.*

A listing, such as shown below, may be helpful in obtaining a picture of the services offered, and such a list should be prepared for each public health agency operating in the study area.

If there is no *local* program in any of the items below, an attempt should be made to ascertain if there is an adequate *State* program covering the item. If not, a recommendation regarding provision of either a local or a State program will be needed in the survey plan.

Reference may be made also to the list of plan elements to be included in an environmental health plan, as given in Section A of this Chapter.

SANITATION SERVICES — DATA FORM

1. Health Department ....

2. Active Sanitation Programs (other than those treated in individual sections of this chapter)	*Program in Operation [Yes(√) or No(X)]*	*Conducted By:*
Child care homes		
General sanitation complaints		
Hospitals		
Hotels, motels		
Industrial hygiene		
Injury Control (accident prevention)		
Noise control		
Nursing homes		
Pedestrian circulation safety		
Plumbing inspection		
Schools		
Swimming pool sanitation		

K. SOLID WASTES COLLECTION AND DISPOSAL

SOLID WASTES COLLECTION AND DISPOSAL — DATA FORM

1. Area covered by collection system (use one set of sheets for each system) ....

2. Who operates the refuse collection system?

   Name ....

   Address ....

   a. Public agency? ....
   b. Contract collector? ....
   c. Franchised collector? ....
   d. Private hauler or scavenger? ....
   e. How many collectors serve the collection area? ....
   f. What agency regulates refuse collectors? ....

3. Map—Show jurisdiction, franchise or service area and location of disposal sites. (See page 99 for example.)

4. Number of homes served .... Percent of total ....

5. Number of commercial establishments served (retail-wholesale, office, apartment) ....

   Percent of total ....

6. Number of industrial establishments served .... Percent of total ....

7. Has a solid wastes "Master Plan" been developed:

   a. Covering collection? ....
   b. Covering future disposal sites? ....
   c. When? ....
   d. By whom? ....
   e. In collecting data for the plan, was use made of the uniform national format for collection of solid wastes data, as suggested by the PHS Solid Wastes Program? ....
   f. Has the plan been coordinated with the State solid wastes disposal plan prepared by the State agency designated for State and interstate planning for solid wastes disposal? ....
   g. Has the plan been made a part of the areawide comprehensive health plan under Public Law 89-749? ....
   h. Is the plan being followed? ....
   i. How often is it updated? ....

8. Is there a capital improvements program for publicly-owned solid wastes collection and disposal facilities (includes vehicles, transfer stations, incinerators, landfill sites, etc.)? ....

9. Is there an annual capital budget? ....

10. What criteria govern the extension of services? (Enter check if applicable, otherwise enter dash.)

    a. When public funds are available ....
    b. On petition of homeowners ....
    c. Master plan schedule ....
    d. Request of health department ....
    e. Requires solid wastes disposal district formation ....
    f. Other ....
    g. Population density ....
       (Describe definite requirements)

....

....

....

11. How often are solid wastes collected, and what is the charge for this service when publicly provided?

Type of Solid Waste	*Number of collections per week*	*Rate**
a. Mixed refuse		
b. Garbage		
c. Rubbish		
d. Commercial wastes		
e. Industrial wastes		
f. Agricultural wastes		
g. Other		

12. Are enclosed trucks used? ....

13. Is garbage required to be wrapped? ....

14. Are garbage grinders required for newly constructed residences? ....

15. What controls are in effect regarding individual household incinerators or apartment house incinerators?

....

16. Are homeowners required to pay for public service (whether or not service is used)? ....

17. What disposal method is used?

    a. Open dumps ....

....

*Use monthly single-family residence fee. If service is supported by general tax funds, divide expenditure by number of homes served.

b. Sanitary Landfill ....

c. Incinerator .... Capacity ....

d. Other ....

....

....

....

18. Who operates the disposal facility? ....

....

19. What is the distance from the estimated center of population served to the disposal site or sites? ....

20. What charges are made for using the facility? ....

....

SOLID WASTES COLLECTION AND DISPOSAL — SUMMARY CHART

Name of Community	System Operated by	Number of homes		Master Plan	Capital Improvements Program	Capital budget	FINANCED BY			COLLECTION					DISPOSAL		
										Includes			Pick ups per week				
		Total	No. Served				Taxes	Monthly Residential Service Charge	Other (specify)	Mixed refuse	Other (specify)	Enclosed trucks	Summer	Winter	Type	Operated by	Distance from Center of Population Served

SOLID WASTES COLLECTION AND DISPOSAL — EVALUATION GUIDES

COLLECTION AGENCY

A governmentally regulated system of solid wastes collection is preferable to the practice of having individual competitive haulers deal directly with the homeowner. This regulation can be achieved by a governmentally operated system, by having private companies contract with the local government, or by having private companies franchised by the local government.

SOLID WASTES MASTER PLAN

A master plan, based on a thorough engineering analysis, for the collection and disposal of solid wastes is vital in rapidly growing communities. The alternatives are almost insurmountable future problems. Even the best planned solid wastes collection and disposal system will be one of the costliest services provided by a municipality. A poorly planned system is certain to place a continuous, undue burden on financial resources and create ill-will in the community.

Of prime economic importance is the proper location of disposal facilities in relation to future population concentrations. Sites for these facilities must be designated and acquired either through zoning, leasing, purchase, or condemnation to avoid future hostile public reaction as well as to avoid expensive future acquisition costs.

There must be close coordination of the solid wastes collection and disposal services (including any necessary transfer stations) and the community transportation plans to develop the most economic hauling system. Coordination with future recreational area plans may be mutually beneficial through improvement of low land by filling with refuse or incinerator residue.

Under the Federal Solid Waste Disposal Act (Public Law 89-272, Oct. 20, 1965), Federal grants of not to exceed 50 per cent of the cost of solid waste disposal surveys and plans may be made to a single state agency designated to conduct state and interstate solid waste disposal planning. Accompanying the award of such grants, there has been distributed a suggested uniform national format for collection of data on solid waste disposal practices,[1] prepared by the Public Health Service Solid Wastes Program. This uniform format may be used for local data collection. The local master plan throughout its development may (and should) be coordinated with the State solid wastes disposal plan, and should be recognized as one element of the area-wide comprehensive health plan.

EXTENSION OF SERVICE

A definite policy should be established for extending service areas. In contrast to water and sewerage services which require considerable long-range planning of physical needs, solid wastes collection lends itself to somewhat more flexible program planning.

COLLECTION

Collection of residential refuse should include both rubbish and garbage. Where only one type of refuse is collected routinely, experience has shown that the other type is often neglected. Closed body trucks are desirable for preventing material from scattering. Compaction trucks are advantageous under some circumstances because of larger capacity per unit volume. If garbage is collected, it should be done at least twice weekly during the warmer summer months. Weekly collection may suffice during winter months in many parts of the country.

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[1] Three standard forms have been prepared: *Community Solid Waste Program — Community Description Report,* PHS Form 4944-1; *Community Solid Waste Program — Land Disposal Site Investigation Report,* PHS Form 4944-2; *Community Solid Waste Program — Facility Investigation Report,* PHS Form 4944-3; First printing, 1967. The above forms and instructions for their use are contained in the following instruction manual, which should be used to avoid errors of misreporting: *Manual of Instructions and Sample Problem for Use in Conducting the National Survey of Community Solid Waste Practices,* July 1967, PHS Solid Wastes Program. For states which use the PHS data collection forms, the Public Health Service will provide data processing service and will publish annual tabulations as well as periodic statistical analyses of the survey results. Particularly in those areas of the country where mosquitoes constitute an environmental health problem, the following additional data collection form may be found useful: *Solid Waste Management Appraisal,* PHS Form 2.44, March 1967. National Communicable Disease Center, Atlanta, Georgia.

Wrapping of garbage has been found to be an effective means of fly control during summer periods. A number of communities now require the installation of garbage grinders in newly constructed residences, and where sewage disposal facilities are capable of treating this load, this practice is often desirable. Household incineration of combustible refuse should be carefully regulated to prevent insanitary conditions resulting from the possible introduction of non-combustible material, and to control air pollution. In those densely populated urban areas having adequate refuse collection, individual burning of refuse often creates serious air pollution problems and under these conditions communities may wish to restrict or prohibit this method of disposal.

RATE STRUCTURE

Solid wastes collection service charges throughout the area should be determined. A comparison of service charges in the study area, as related to length of haul, may indicate potential savings through relocation of disposal sites, or rerouting of collection trucks. Cost of service is largely determined by collection time, and every effort should be made to route the collection services most efficiently in view of changing needs.

All homeowners within the area served by a publicly operated collection system should be required to pay whether they choose to receive the service or not.

DISPOSAL FACILITIES

Because of nuisance conditions and health hazards, open dumps and open burning are not acceptable. Other disposal methods such as the sanitary landfill or incinerator are satisfactory when properly operated. The disposal site should be as near as possible to the area it serves, preferably not more than 10 miles away.

DISPOSAL COSTS

Operating cost for sanitary landfills currently ranges from $1.00 to $2.00 per ton of refuse. Incinerator costs are considerably higher, but may be offset by shorter haul distances. Cost of incineration usually ranges from $3.50 to $8.00 per ton of refuse. Where charges are made for the use of the disposal facilities, a weight basis is more equitable than a volume basis. Charges should reflect both operating and replacement costs.

AREAS SERVED

In the same manner as previously described in evaluating water and sewerage services, the solid wastes service area map should be compared with the population density maps to determine coverage in the various density groupings. The following table assumes average topography and reasonable length of haul, and is based on cost research using various numbers of collection stops per mile. As a "rule-of-thumb" guide, it can be used for determining the economic justification of service under average conditions.

Population Density	*Equivalent Lot Size*	*Service Economic Justification*
Over 2,500 persons/sq. mi.	Less than 1 acre	Service is justified
1,000-2,500 persons/sq. mi.	1 to 2 acres	Service is normally justified
500-1,000 persons/sq. mi.	2 to 4 acres	Service is not normally justified
Less than 500 persons/sq. mi.	Over 4 acres	Service is rarely justified

L. VECTOR CONTROL

VECTOR CONTROL—DATA FORM

1. Does a rodent problem exist in the area? ....

   a. Is there a regular rodent control program? ....

   b. What agencies conduct the program? ....

   ....

   ....

   Is the program adequate? ....

   c. Are regular checks made on rodent population and complaints followed up? ....

   d. Do dumps, rubbish, sewers, or other food or harborage sources exist uncontrolled? ....

   e. Do local building and housing codes include structural rodent-proofing requirements? ....

   f. Are there problems from external parasites? ....

   Are these properly controlled previous to rodent control? ....

   g. What is the estimated rodent population as a percentage of human population in urban area? .... in heavily infested area? ....

   % of surveyed blocks infested .... % of inspected premises infested ....

   h. How many persons, including infants, have been bitten by rats, per year during the last 5 years?

Year	*Rat-bite injuries*		*Rat-bite deaths*
	Reported	*Est. Total*	
....	....	....	....
....	....	....	....
....	....	....	....
....	....	....	....
....	....	....	....

2. Does the community have a problem from flies or gnats? ....

   a. Is there a regular fly control program? ....

   b. What agencies conduct the program? ....

   ....

   ....

   Is the program adequate? ....

   c. Are regular checks made on fly population and complaints followed up? ....

   d. Do uncontrolled fly breeding areas exist in the vicinity? .... Open dumps? .... Rubbish piles? .... Compost heaps? .... Livestock feeding areas? .... Poultry farms? .... Dairy farms? .... Cannery wastes? .... Riding stables? ....

e. Is commercial garbage collected daily? .... Is residential garbage collected twice per week during warm weather? ....

f. Are garbage storage containers frequently inspected? ....

Premises? ....

g. Do privies exist? .... Is there a program for their removal? ....

h. Are homes and restaurants screened or otherwise protected? ....

3. Is there a mosquito problem in the area? ....

a. Is there a mosquito control program? ....

b. What agencies conduct the program? ....

....

....

Is the program adequate? ....

c. Is area-spraying properly controlled? ....

d. Are irrigation and agricultural water sources controlled? ....

e. Do reservoirs, drainage ditches, catch basins or other standing water sources exist as uncontrolled breeding places? ....

f. Is there a program to eliminate standing water sources in or near residential areas? ....

g. Are shorelines of permanent water bodies kept clean and weed-free? ....

4. Is there a large wild pigeon population? .... In what part of the survey area? ....

....

a. Have any local disease cases been traced to wild pigeons or their parasites? ....

b. Are any local economic losses attributed to wild pigeon or other bird problems? ....

Property deterioration and defacement? ....

Food contamination? ....

c. Have wild pigeon control operations been undertaken or attempted? ....

By what agency? ....

5. What are the budgets of present vector control programs? ....Rodent ....

Mosquito .... Others ....

....

a. What changes are presently proposed in program budgets? ....

....

....

b. Are there funds and procedures for emergency control programs? ....

c. Are there any economic losses presently occurring from a vector problem? ....

What? ....

6. Are adequate records kept of communicable diseases ...., rat bite injuries and deaths ...., and public nuisances .... caused by vectors?

7. Do strong community ordinances exist to enforce vector control measures? ....
....

8. Is there proper and sufficient cooperation between neighboring jurisdictions on control programs? Explain.
....
....

9. Is the vector control program properly integrated with other health department and area programs and functions? ....

10. Are control program workers properly trained? ....

Is there sufficient personnel with training and/or experience in entomology or biology? ....
....

11. Do commercial pest control operators (exterminators) work in the area? ....

a. Are they licensed and regulated by the State Health Department or other responsible agency? ....
....

b. Is there satisfactory liaison between local governmental vector control agencies and commercial pest control operators? ....

12. Is there a program of citizen education? .... Are regular releases made to the public media to keep citizens informed of their important role in vector control? ....
....
....
....

VECTOR CONTROL — EVALUATION GUIDES

RESPONSIBLE AGENCY

Health departments have vector control as part of their responsibility in controlling communicable diseases and public nuisances. Responsibility for the control of vectors causing severe problems in an area can be delegated to a special district which concentrates on the problem area. Personnel responsible need special training in entomology or biology.

AREAS SERVED

Vectors respect no political border lines; therefore, any successful control program must cover the entire problem area with cooperation among municipal, county, and district governments.

VECTORS AND CONTROL

The principal problem vectors are rodents, ectoparasites (external parasites), mosquitoes, flies, and gnats. Large populations of pigeons or other birds can also cause health and economic problems in urban areas. As well as causing disease, bite injuries and nuisance problems, excessive vector populations can affect area economy in such ways as defacing property, reducing tourist income and limiting agricultural production. Sanitation and cleanliness are factors in vector control. Vector populations are minimized by control of standing water, wooded environments, solid organic wastes, livestock feeding areas, dairy farms, poultry farms, rubbish piles, open refuse dumps, and insanitary privies. Continuous effort is necessary to limit and control areas where vectors can harbor, feed, and breed.

Surveys of vector populations should be conducted at periodic intervals to note any growing or potential danger.

CITIZEN EDUCATION

Each unit of property within a community is a potential source of vectors. A continuous education program must be carried out to keep all citizens apprised of their responsibility in eliminating sources of vector feeding, breeding, and harborage. Citizen complaints must be regularly followed up and corrective measures taken; complaint records, including maps, are helpful in pinpointing problem areas.

COMMERCIAL PEST CONTROL OPERATORS (Exterminators)

Insect and rodent control problems on individual premises are often handled under contract between the property owner and a commercial pest control operator. This is particularly true of restaurants, hotels, and other business establishments, and many home owners also avail themselves of services of this type for the control of household pests such as cockroaches. For the protection of the public, many states require commercial pest control operators to meet standard requirements of training, experience, competence, and performance to qualify for a license. Competent pest control operators play an important role in vector control in most communities; every effort should be made to establish and maintain a high degree of cooperation between these pest control operators and public vector control agencies.

M. ENVIRONMENTAL HEALTH PROJECT PROGRAMMING—DATA FORM

1. On what basis are decisions made among alternative projects?

   a. Do comparisons of alternative investments take into account the time-value of money?

   b. Are the costs and benefits of all alternatives summarized and presented to the appropriate decision-making body?

2. Are priorities established by comparing projects from all areas of community need?

3. Has an analysis been made of the community's economy (industry, expansion potential, etc.)?
   By whom? Are the data current?

4. Does the community know its financial status?

   a. Have all reasonable sources of project financing been studied: service charges?
      new or increased taxes? reassessment of property?
      bonded indebtedness? grants-in-aid? cost sharing?
      other?

   b. What is the limit of the community's bonded indebtedness?
      What is the value of bonds presently outstanding?
      What is the present repayment schedule?

   c. What are the present community taxes and their rates?
      What percent of assessed valuation of property is taxed?

   d. What are the current and expected yields?

   e. Has the possibility been examined of sharing projects with neighboring governments?

5. Has a capital improvements program been prepared?
   How far in the future?
   Is it reviewed and updated at least annually?

6. Is a capital budget adopted each year?
   Does it follow closely the capital improvements program previously prepared?

7. **Is the annual operating budget fully coordinated with the capital budget to include funds for operation and maintenance of new capital projects?** ....
....

8. **What is the role of planning agencies in preparation of the capital improvements program and the capital budget?**
   a. **Areawide comprehensive health planning agency:** ....
   ....
   b. **Physical development planning agency:** ....
   ....

ENVIRONMENTAL HEALTH PROJECT PROGRAMMING — EVALUATION GUIDES

COMPARISON OF ALTERNATIVES

Each environmental health problem usually presents several alternative solutions to a community. All alternatives should be realistically evaluated to choose the project which will be most beneficial to the community. This procedure also applies to subsystem design decisions, i.e., those relating to project components. A recommended series of steps for analyzing alternatives is as follows:

1. Establish objectives for the problem in question, such as a desired level of sanitation, and minimum cost of accomplishment.
2. Clearly define all reasonable alternative solutions and their consequences. Such a definition often includes a comparison with the alternative of no project in the area of consideration.
3. As far as practicable, list the monetary costs and benefits of each alternative so that differences can be compared.
4. Recognize the time-value of money and the risk of any investment by applying an interest rate to cash-flows which occur at different points in time. The need to do this is demonstrated by the fact that a city could alternatively invest a project's money in a bank and receive interest payments.
5. Consider those factors which cannot be expressed in monetary terms. Many health and sanitation costs and benefits are in this category.
6. Present all of the alternatives, with summarized monetary and nonmonetary costs and benefits, for consideration by the person(s) responsible for the final decision.

PROJECT PRIORITIES

Once the specific desired projects are determined for each environmental health problem area, priorities must be established. Costs and benefits of the desired projects must be judged in the light of community needs and goals.

ECONOMIC AND FINANCIAL ANALYSES

To schedule when specific projects can be undertaken, a community must have a realistic understanding of its economic and financial status. Studies should be made of present community debt in relation to allowable bondability, present revenue sources, and potential changes in revenues and tax base.

Several methods of financing are usually available and should be examined. These include general revenue, service charges, new or increased taxes, bonded or other indebtedness, grants-in-aid from State or Federal governments, and cost-sharing with neighboring governments. An examination of the costs and benefits involved can often point up savings possible through project sharing with neighboring governments.

CAPITAL IMPROVEMENTS PROGRAM AND CAPITAL BUDGET

Every community should have a capital improvements program identifying the projects to be undertaken over the next five or six years. These should be listed by priority, anticipated year of initiation, expected cost, and proposed method of financing. All segments of the capital improvements program should receive annual review and extension to meet changing community conditions and goals and maintain the forward programming.

In formulating the annual capital budget with its specific financing provisions, consideration must be given to the operating and maintenance expenditures required by each capital improvement project, and such expenditures must be included in the annual operating budget.

Chapter III

USING THE DATA

PREPARING THE ENVIRONMENTAL HEALTH PLAN

After completion of the survey phase involving collection of data and preliminary evaluation as described in Chapter II, the technical skills of professional planners, environmental health engineers, and sanitarians may be further enlisted to complement the skills of the study group in the task of preparing an environmental health plan.

The environmental health arm of the areawide comprehensive health planning agency can join forces with the local and metropolitan physical development planning agencies to provide an official home for the technical planning effort, which may be energized by non-governmental community groups, such as the Chamber of Commerce, League of Women Voters, community organizations, citizens associations, etc., as well as by the elected local governing bodies.

ANALYSIS

The data collected may be subjected to analysis along several lines. An early step might involve assessment of past and current utilization of existing environmental health facilities, services, and manpower. From a general evaluation of the environmental health status of the study area, a preliminary statement of goals for environmental health planning may be formulated. By comparison of current environmental health facilities, services, and manpower with environmental health goals, an evaluation of current environmental health needs can be prepared.

Next, from the data collected (which should relate to an extended time period as a base), projections can be made of probable future conditions, not only in environmental quality but also in probable future environmental health programs and probable future needs. On the basis of these projections of the future, it will prove feasible to make a more refined statement of goals — goals which, if reached, would correct existing environmental health deficiencies and would prevent or forestall the creation of additional future deficiencies.

The final stage of analysis would normally involve the identification and evaluation of the alternatives that are available. Written descriptions of alternatives, in text or map form, or both, may be developed for the bundle of projects or programs that would constitute each functional plan element, such as water, sewer, solid wastes, etc.

Similar statements of alternatives, to be formulated prior to preparation of functional plan elements, could be developed for:

1. Objectives (intermediate check points to be reached on the way to ultimate goals)
2. Policies, to be employed in reaching objectives
3. Criteria, to be used in measuring and describing levels of health, and
4. Standards, marking acceptable levels of health.

DESIGN, OR PLAN MAKING

This most critical step of actually making the environmental health plan involves (1) the selection and adoption by the planning staff of its preferred alternatives from among those analyzed in each functional area, and (2) the integration, with any necessary adjustments, of all plan elements into a coordinated and harmonious whole.

Selection of preferred alternatives which, taken together, will constitute the proposed plan, should be done in all the above-mentioned areas from goals to programs.

Under the Comprehensive Health Planning and Public Health Service Amendments of 1966, Public Law 89-749, Federal financial assistance is available to areawide comprehensive health planning agencies for preparation of environmental (as well as physical and mental) health plans.

Inquiries regarding submission of applications for such assistance may be addressed to the State agency designated in each State to carry out Statewide comprehensive health planning, and to the appropriate regional office of the Public Health Service.

Chapter IV
IMPLEMENTATION

An environmental health plan is of little value unless it becomes implemented by adoption of one or more of its proposals. The strategy for gaining acceptance and implementation starts well back in the planning process. The process envisioned in this Guide starts with the survey outlined previously. The next step is the development of specific functional elements of an environmental health plan, such as the major plan elements described in this Guide, according to priorities developed in preparation of the study design. The third step is to integrate the several functional plan elements into an Environmental Health Plan. The fourth step is to integrate the Environmental Health Plan into the Comprehensive Health Plan for the area. The fifth step is the coordination of the Comprehensive Health Plan with the comprehensive physical development plan for the urban area developed by the planning department. At any stage after the second, it may be decided that a specific plan element or group of elements should be adopted. Finally, following such adoption, there will be need of support to carry out the specific projects of adopted plans. Therefore, during the survey, it is pertinent to check whether or not there is an adequate community organization program designed to allow and encourage lay citizens to participate in the survey, the priority setting, the detailed planning and the plan adoption, and to support projects to carry out the plan.

The city, county, or metropolitan area should have or develop an adequate, and, as need be, professionally advised, community organization effort designed to gain implementation of the environmental health plan. This should consist of some or all of the following, found essential in implementation of previous environmental health planning efforts:

1. Identification of top leaders and of all major factions in the community, and their subsequent involvement in the planning process.
2. In communities over ¼ million, involvement of religious, civic, economic, educational, and professional organizations in establishing the project goals for health and/or urban regional planning.
3. Use of community-organization techniques for developing communication adequate to gain support of implementation of plans developed in accordance with priorities established by surveys such as this, and by definition of planning project goals; this effort should involve all organized groups at the pertinent level of operation, i.e. neighborhood, district, city, county or metropolitan region.
4. When dealing with areas where a large percentage of residents has a low level of education or income, a large staff of health educator aides should be given modified community-organization and sensitivity training to enable them to carry out personal contacts with each household for the purpose of environmental health training and referral, (*a la* PHS-Chicago Health Department program.)

First is the involvement of top leadership of the urban community and its developing fringe areas in the survey-planning process. In this type of community-organization work, the top leadership is identified in the several jurisdictions, and those who are influential in the total metropolitan area are invited to become involved in the survey work. It is also essential to identify all major factions in the total community to be sure they are represented by one or more of the identified leaders. If such is not the case, then the most influential leader of an unrepresented faction is added to the list and likewise involved in the survey process. The most efficient, quick and inexpensive method for identifying such leadership and factions is that developed by Dr. Irwin T. Sanders in *Preparing a Community Profile: The Methodology of a Social Reconnaissance,* Bureau of Community Services, Kentucky Community Series No. 7, University of Kentucky, Lexington, Kentucky, 1950. This method has been successfully used in gaining improved environmental health plan implementation by the Georgia Department of Public Health. (See pamphlet *Community Social Analysis of Savannah-Chatham County,* Community Social Analysis No. 1, Harold L. Nix, and Charles J. Dudley, Institute of Community and Area Development, Department of Sociology and Anthropology, University of Georgia, Athens, Georgia.) The identification in a community of 300,000 or less requires five man-days of a professional sociologist for both the interviewing and report-writing.

The second type of community organization effort relates to the involvement of leadership in the environmental health planning process prior to initiation of a survey in a large metropolitan region. The several citizens' committees connected with the Los Angeles Goals Project for city and regional planning constitute an example. These committees represent appropriate professional, economic and civic groups, religious organizations, etc., as well as individual experts who have special inputs for the committees' work. The committees are (1) Economic and Business Goals Committee, (2) Social and Religious Goals Committee, (3) Science and Technology Goals Committee, and (4) Environmental Goals Committee. This second type of involvement of group leadership and professionals will serve a useful role in building appropriate communications for support of the planning process in the larger community. It is unnecessary to include this second type in the smaller community. It is suggested, nonetheless, that even in the large communities, the first type be undertaken to assure top leadership involvement in the early stages of the planning process.

The third type of community organization effort occurs after the goals, plans, and project priorities have been established. It is the more traditional community organization work of building support for plan adoption and implementation among the neighborhood, district, city-wide, and metropolitan groups. At the neighborhood level, the community-organization talent may have to coach both neighborhood and city-wide groups to communicate effectively with each other, and help individual groups first become involved in the environmental health planning process at some point that interests the membership. Typically, at this level the effort is gauged to help the residents help themselves gain a better environment. After their first success, it is feasible to involve them in the wider planning process. At the other levels, district, city-wide and community-wide, the community-organization objective is to gain sound communication among the planners, the action departments and the organized groups, so that mutual feedback can be usefully considered prior to hearings and voting in which support is needed.

The fourth aspect of community-organization work relates to the training of personnel in appropriate departments (health, planning, housing, etc.,) to contact the residents in low-income, low-education neighborhoods on a dwelling-by-dwelling basis, in order to encourage them to use their environment more constructively and to train them to maintain essential sanitation. After local residents have realized that improvement in their living conditions can be gained by coordinated self-help, they can then be encouraged to join in small block-groups for more conventional group support of planned programs. The need for this fourth type of approach to this segment of the population lies in the fact that, according to national surveys, 78% of such people are not members of any voluntary association, and need face-to-face contacts in order to change their attitudes and habits.

IMPLEMENTATION -- DATA FORM

1. Does any of the health agencies in the study area use any one of the four community organization techniques described above? (Yes or no) .... Which agencies? ....

   ....

   Which techniques? ....

2. Does any of the planning agencies in the survey area use any one of the four community organization techniques described above? (Yes or no) ....

   Which agencies? ....

   Which techniques? ....

3. Are there any public employees in the study area trained in community organization techniques? (Yes or no) ....

   By which agency are they employed? ....

4. Are there any trained community organization specialists available in private agencies in the study area, (such as community fund or council, social-work agency, Chamber of Commerce, etc.)? (Yes or no) ....

   Which agencies? ....

5. Are there county agents, health educators, etc., available who practice community organization work but may not be professionals devoting full time to such efforts? (Yes or no) ....

   Which agencies? ....

6. Are there professional community organization specialists available within the State on a consultant basis from a University Community Development Program, school of social work, etc.? (Yes or no) ....

   Name and address of employing organization ....

APPENDIX

ENVIRONMENTAL HEALTH PLAN FORMAT AND SKETCH MAPS

Because of the joint interest in most of the functional elements of an environmental health plan on the part of the areawide comprehensive health planning agency and the local and metropolitan physical development planning agencies it is recommended that the format for publication of the Environmental Health Plan be selected with the advice and approval of those agencies. The format should be reasonably compatible with published portions of adopted physical development plans for the particular urban area concerned.

In the normal planning operation, there is likely to be a separate bound document, consisting of text, tables, charts, graphs and maps, for each functional element of the plan, in preliminary plan form.

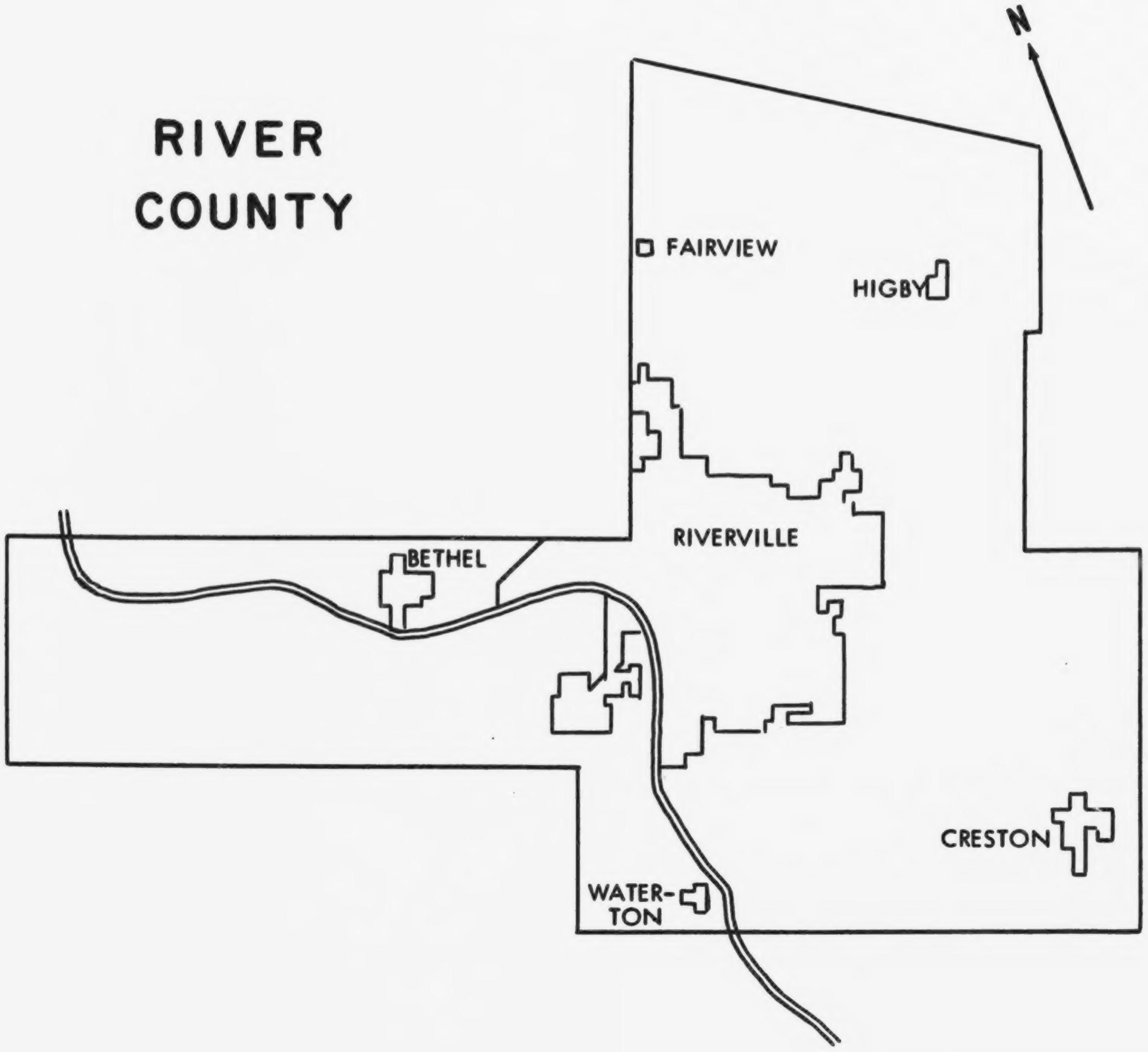
After several of these have been prepared *seriatim,* there may be a published comprehensive environmental health plan which integrates previously published functional elements on a preliminary basis. Additional plan elements can be added as they become available and the comprehensive plan is revised.

After conformance with statutory requirements for public hearing, etc., under physical development planning legislation, functional elements and comprehensive plans may be republished in final form as adopted.

As indicated earlier in this Guide, adopted plans should be reviewed periodically and revised as may be appropriate.

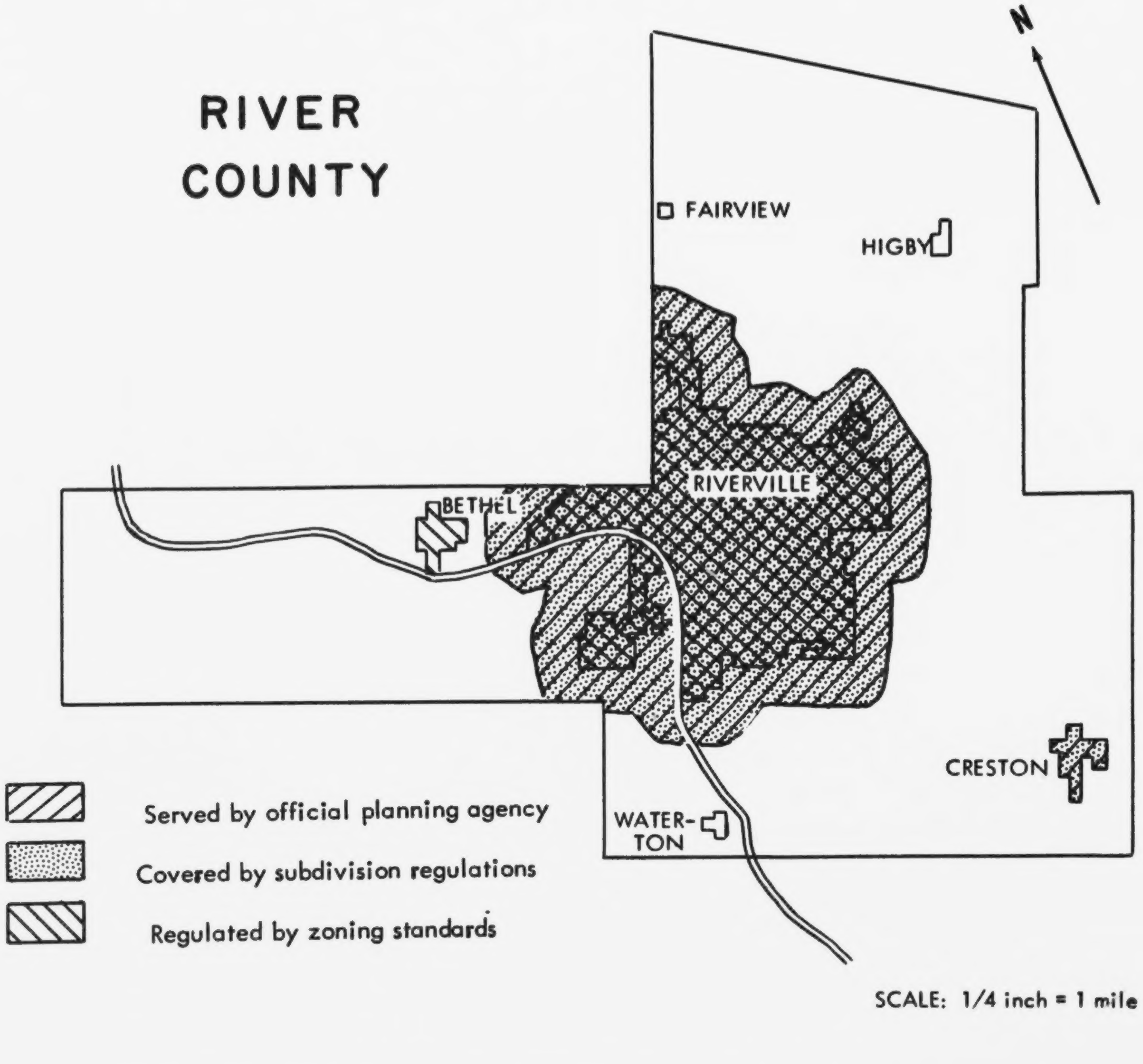
There follows a series of simplified sketch maps suggesting approaches to recording of survey data in the initial survey phase. The health planning and physical development planning agencies will be working with larger size, more detailed, and more sophisticated versions of such maps.

STUDY AREA MAP

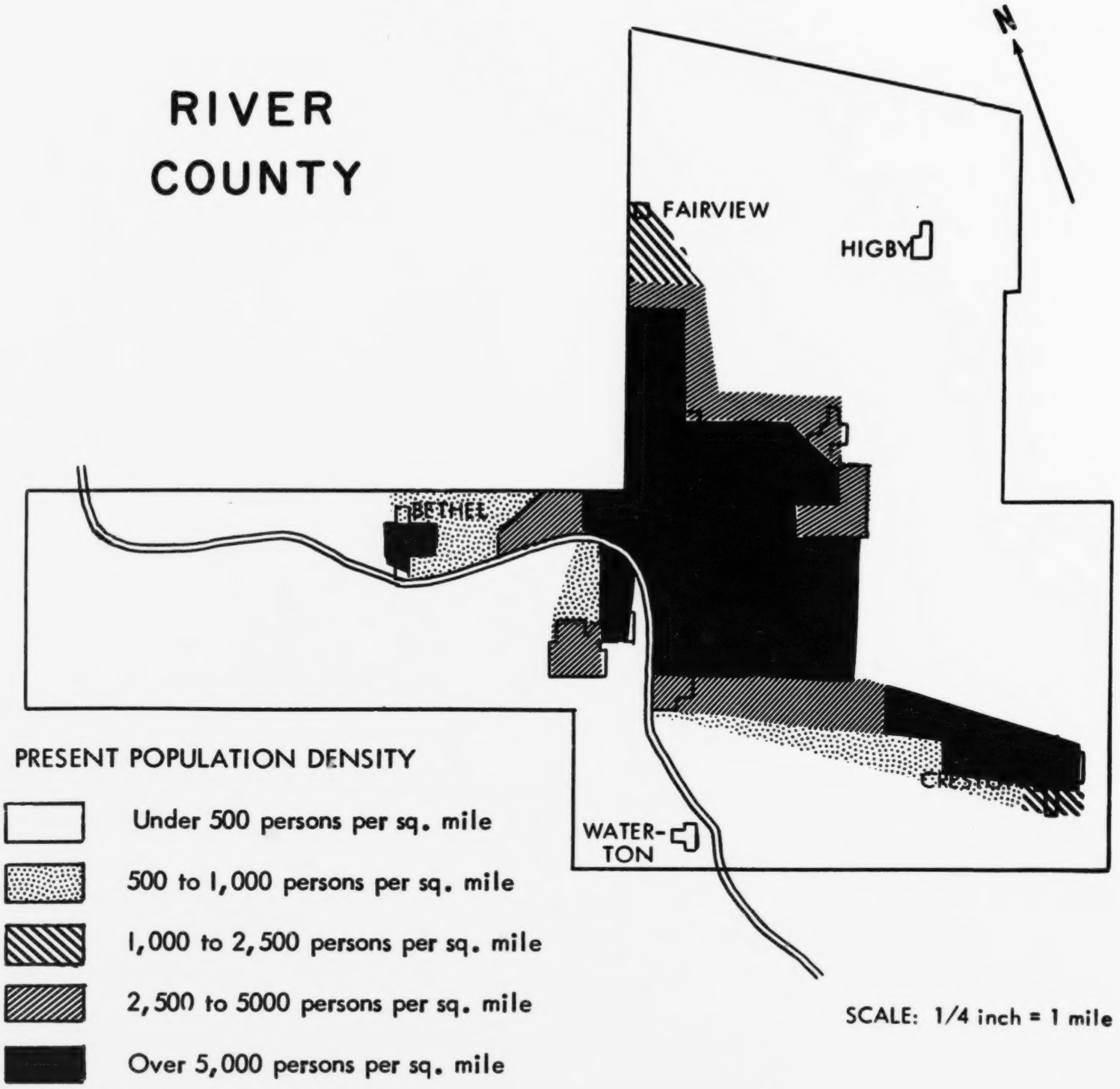

N
RIVER
COUNTY
FAIRVIEW
HIGBY
RIVERVILLE
BETHEL
CRESTON
WATER-
TON

SCALE: 1/4 inch = 1 mile

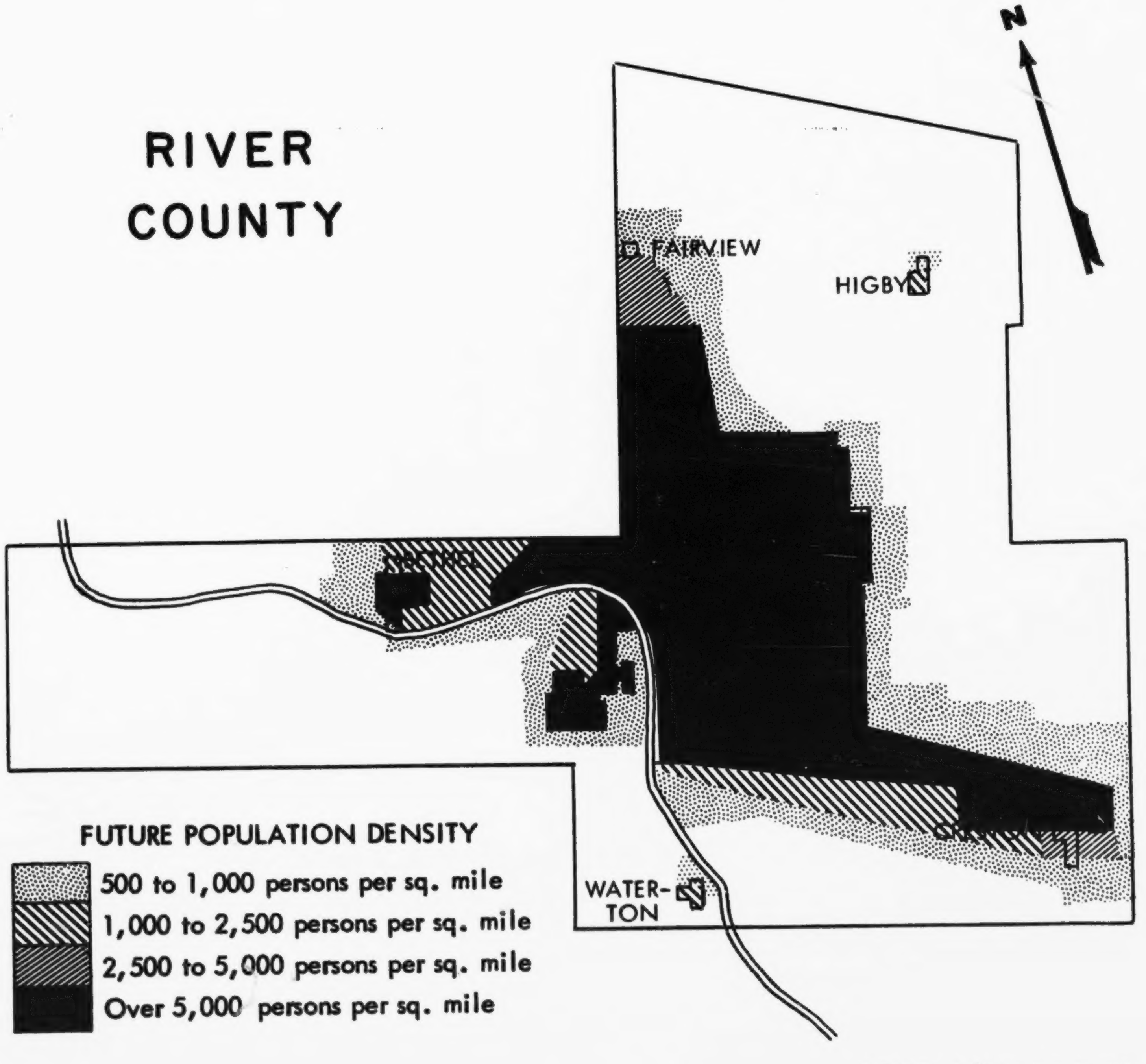
PLANNING OPERATIONS MAP


RIVER COUNTY
N
FAIRVIEW
HIGBY
RIVERVILLE
BETHEL
CRESTON
WATER-TON
▨ Served by official planning agency
▨ Covered by subdivision regulations
▨ Regulated by zoning standards
SCALE: 1/4 inch = 1 mile

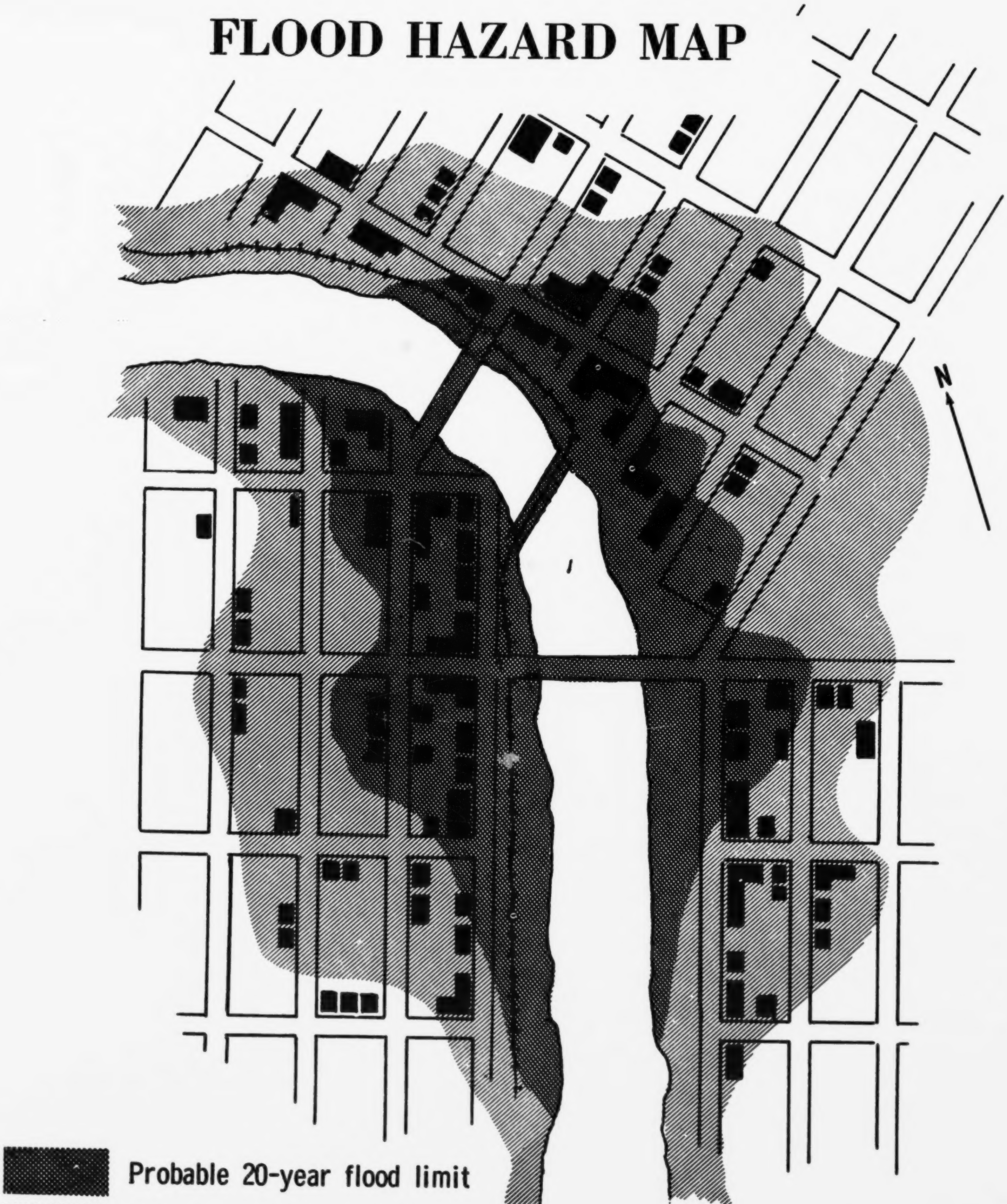
PRESENT POPULATION DENSITY MAP


RIVER COUNTY
N
FAIRVIEW
HIGBY
BETHEL
CRES
WATER-TON
PRESENT POPULATION DENSITY
Under 500 persons per sq. mile
500 to 1,000 persons per sq. mile
1,000 to 2,500 persons per sq. mile
2,500 to 5000 persons per sq. mile
Over 5,000 persons per sq. mile
SCALE: 1/4 inch = 1 mile

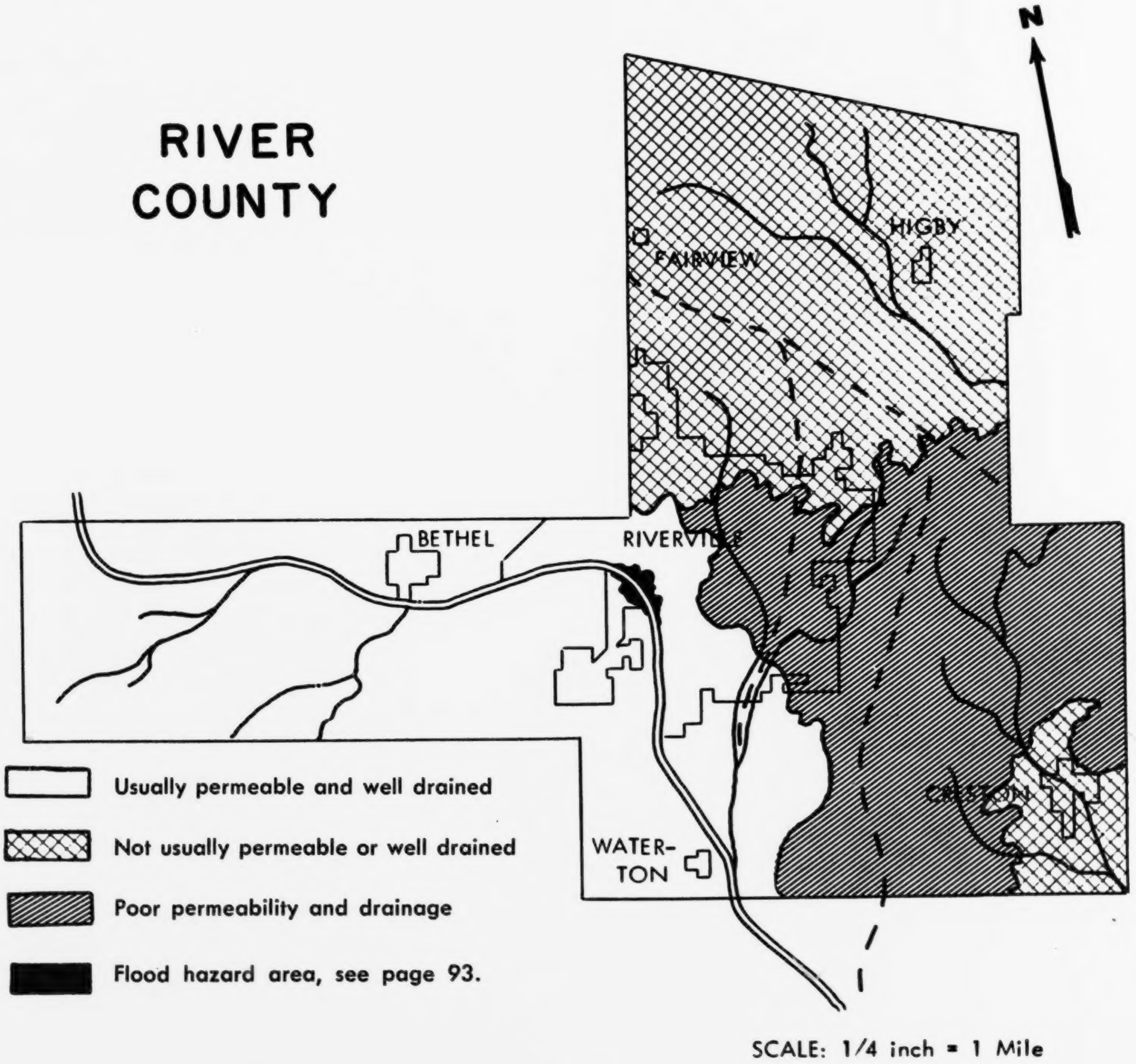
FUTURE POPULATION DENSITY MAP


N
RIVER COUNTY
FAIRVIEW
HIGBY
WATER-TON
FUTURE POPULATION DENSITY
░ 500 to 1,000 persons per sq. mile
▧ 1,000 to 2,500 persons per sq. mile
▨ 2,500 to 5,000 persons per sq. mile
■ Over 5,000 persons per sq. mile
SCALE: 1/4 inch = 1 mile

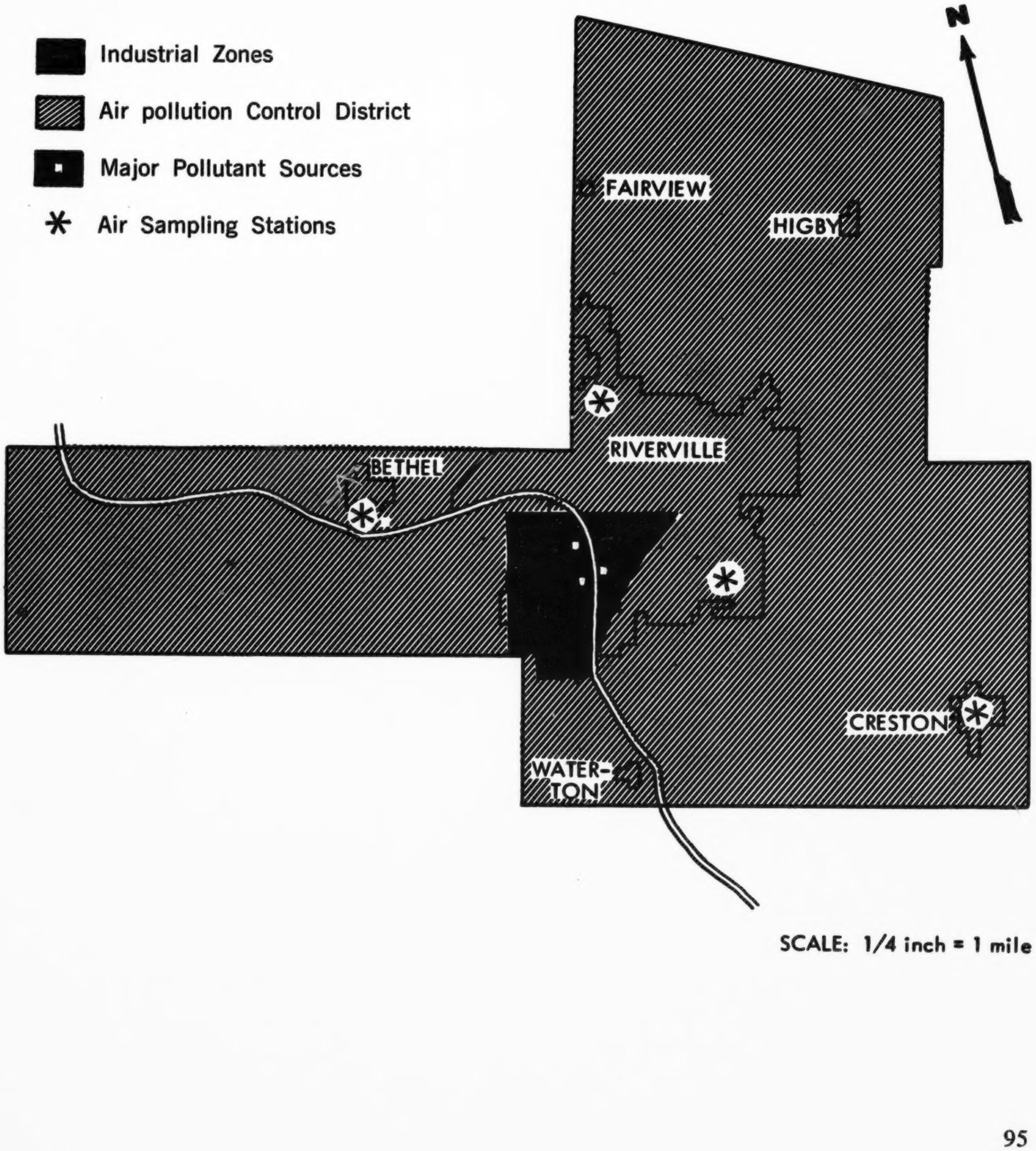
FLOOD HAZARD MAP


N
▆ Probable 20-year flood limit
▨ Probable 50-year flood limit

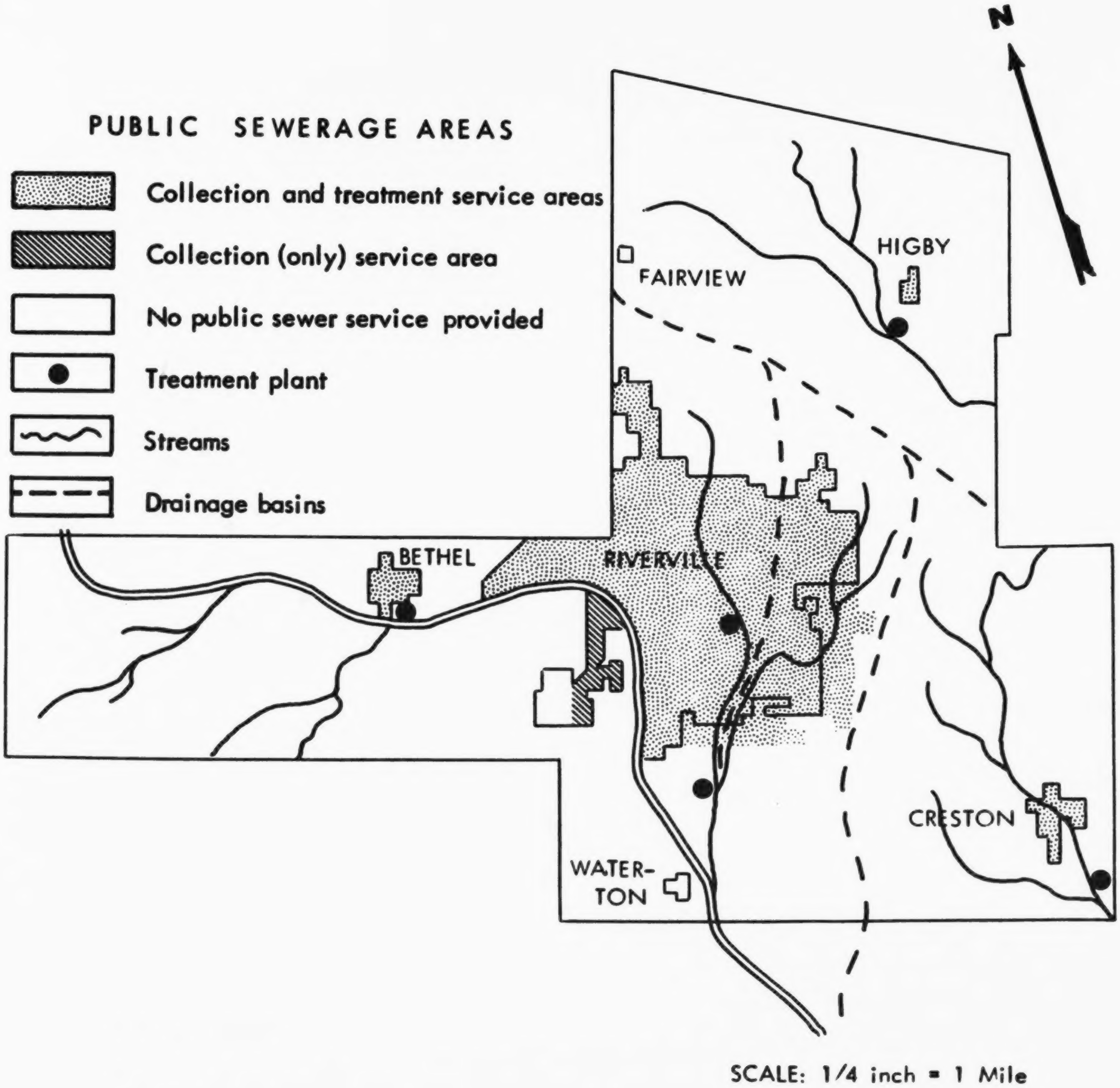
DRAINAGE AND SOIL MAP


RIVER COUNTY
N
HIGBY
FAIRVIEW
BETHEL
RIVERVILLE
WATER-TON
CRESTON
Usually permeable and well drained
Not usually permeable or well drained
Poor permeability and drainage
Flood hazard area, see page 93.
SCALE: 1/4 inch = 1 Mile

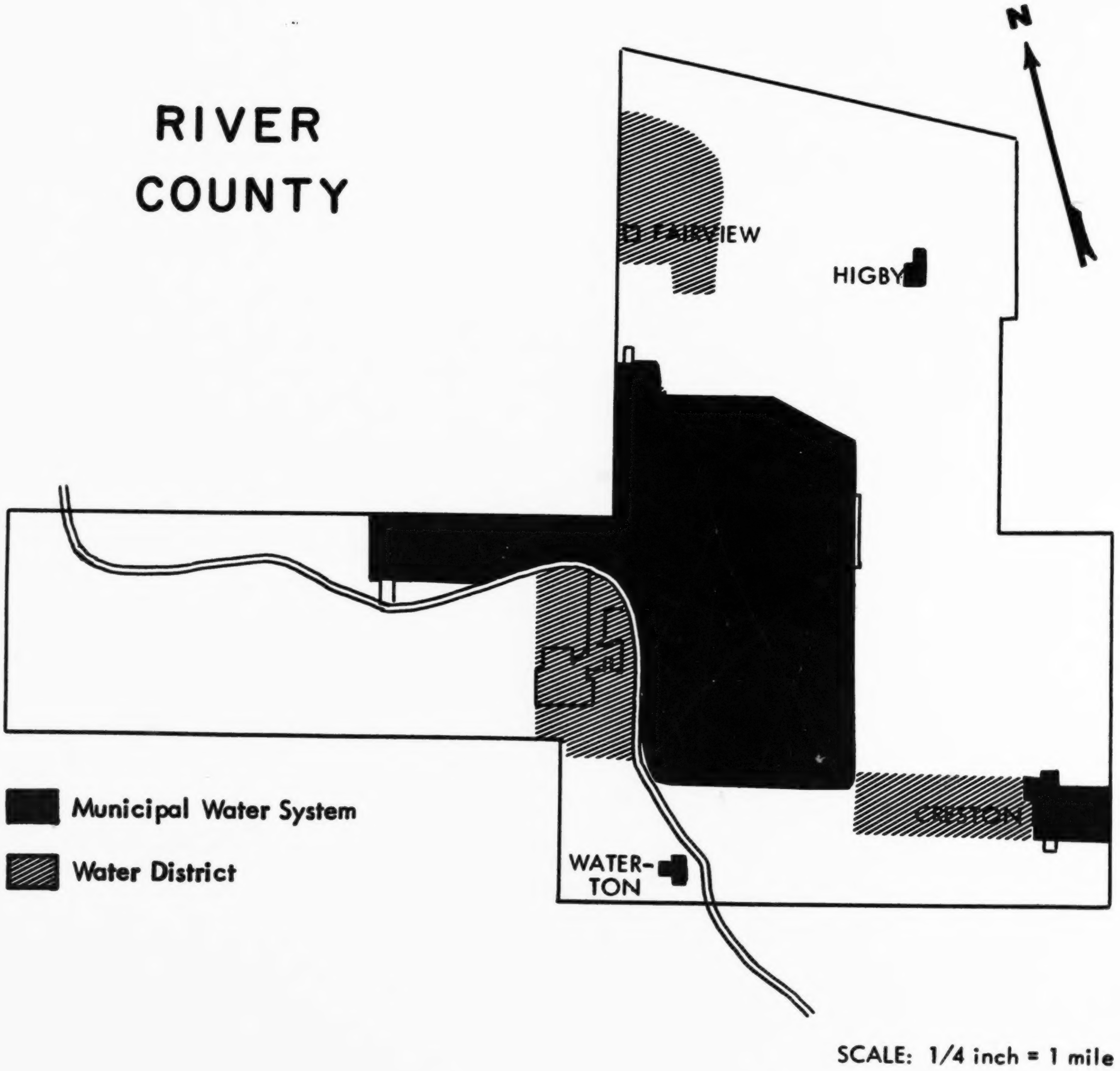
AIR POLLUTION MAP


Industrial Zones
Air pollution Control District
Major Pollutant Sources
Air Sampling Stations
N
FAIRVIEW
HIGBY
RIVERVILLE
BETHEL
CRESTON
WATER-TON
SCALE: 1/4 inch = 1 mile

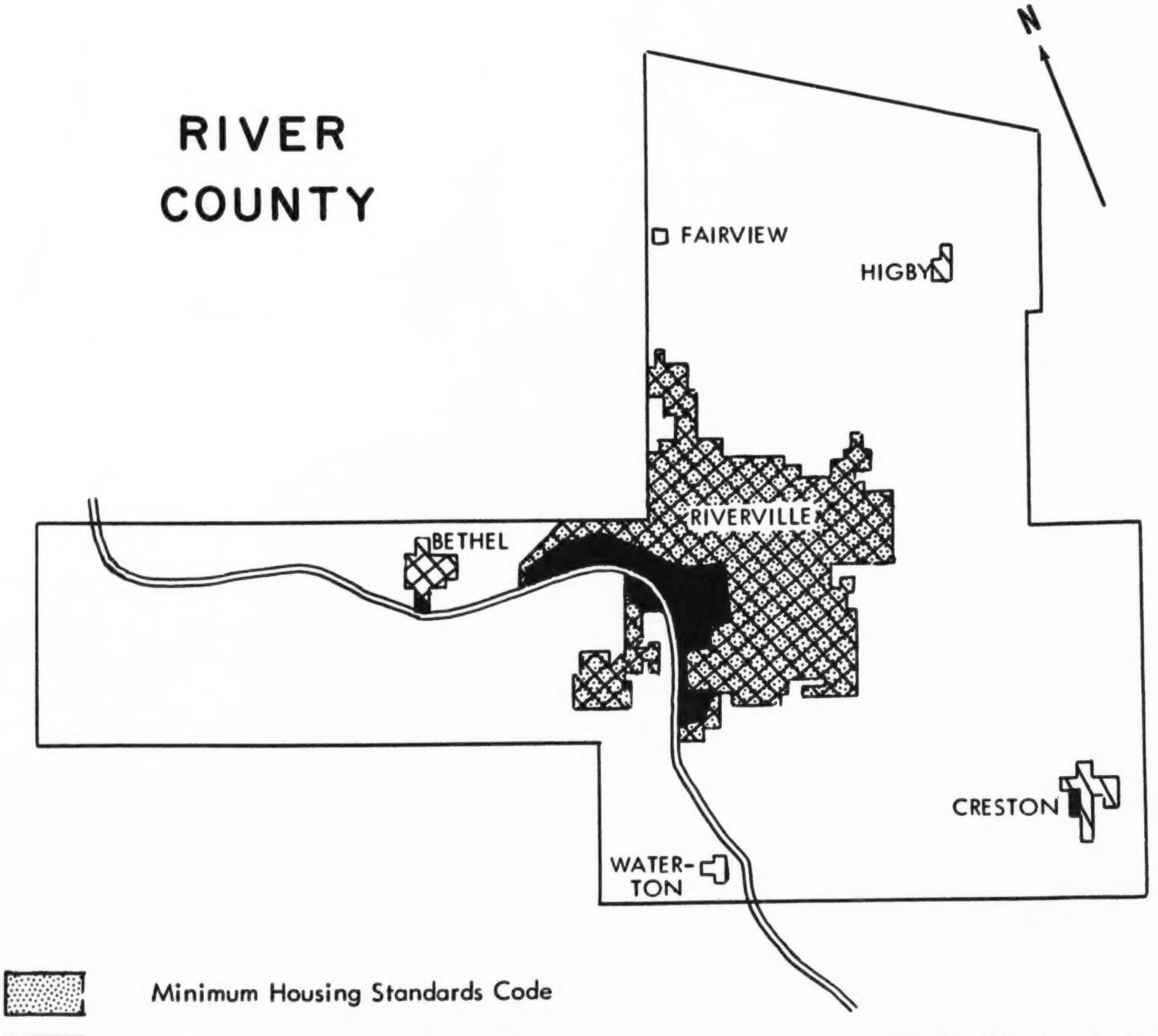
PUBLIC SEWER SERVICE MAP


PUBLIC SEWERAGE AREAS
Collection and treatment service areas
Collection (only) service area
No public sewer service provided
Treatment plant
Streams
Drainage basins
N
HIGBY
FAIRVIEW
BETHEL
RIVERVILLE
CRESTON
WATER-
TON
SCALE: 1/4 inch = 1 Mile

PUBLIC WATER SERVICE MAP


RIVER
COUNTY
N
FAIRVIEW
HIGBY
CRESTON
WATER-
TON
Municipal Water System
Water District
SCALE: 1/4 inch = 1 mile

RESIDENTIAL ENVIRONMENT MAP


N
RIVER COUNTY
FAIRVIEW
HIGBY
RIVERVILLE
BETHEL
CRESTON
WATER-TON

░ Minimum Housing Standards Code

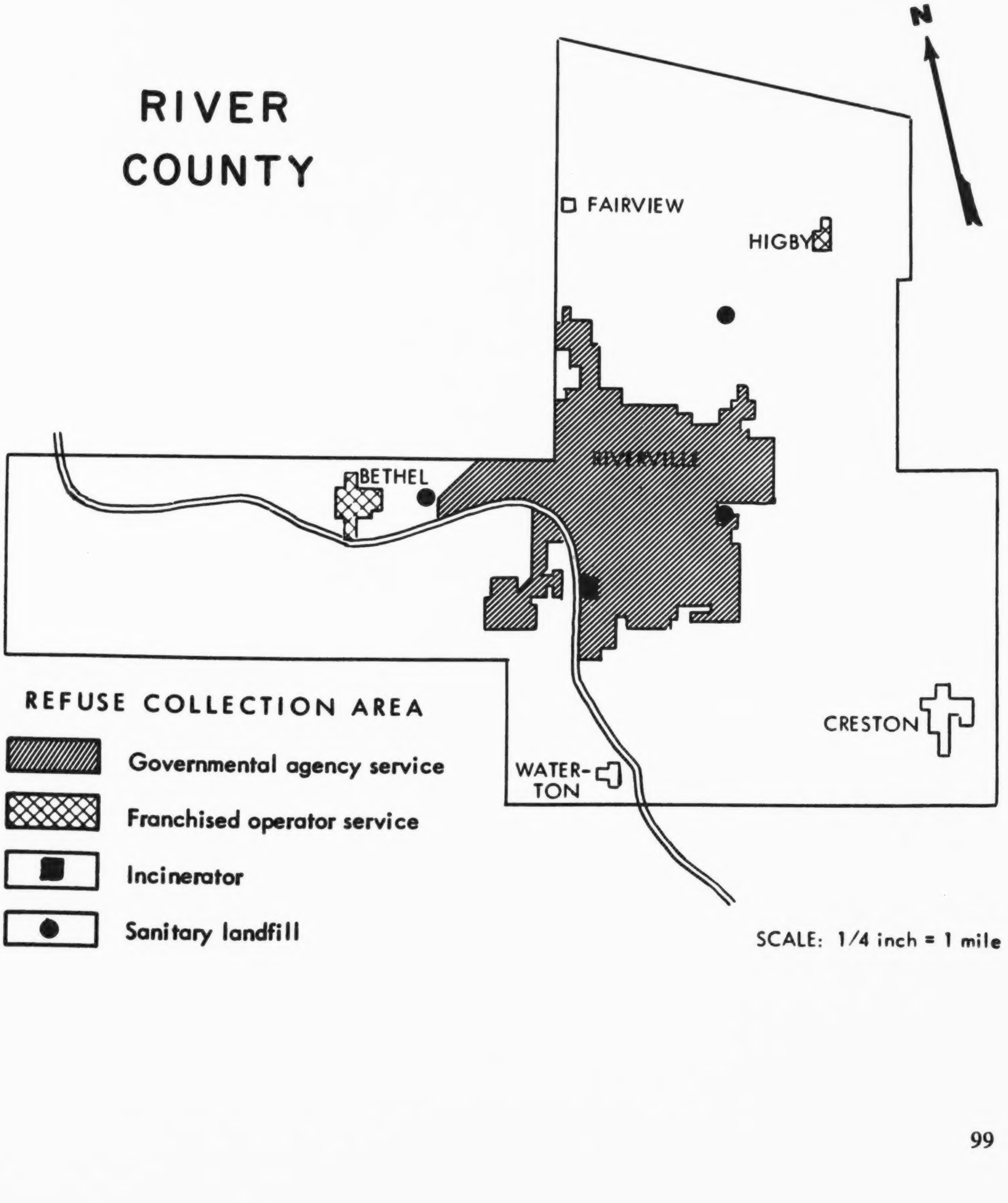
▨ Building, Plumbing, and Electrical Code

▧ Zoning Regulations

■ Substandard Housing

SCALE: 1/4 inch = 1 mile

SOLID WASTES MAP


RIVER COUNTY
N
FAIRVIEW
HIGBY
RIVERVILLE
BETHEL
CRESTON
WATER-TON
REFUSE COLLECTION AREA
Governmental agency service
Franchised operator service
Incinerator
Sanitary landfill
SCALE: 1/4 inch = 1 mile

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